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ABSTRACT

Data collected during the first year of a 3-year study are reported. The study evaluated the effectiveness of a variety of special services provided to approximately 10,000 language-minority limited-English-proficient first- and third-grade students in English-medium classrooms in a national sample of 18 school districts. Services studied are not limited to those funded under any one program or by any single source. The present report summarizes the characteristics of the study's students, services, and schools. The first chapter offers background information, and the second chapter gives an overview of the study's design and implementation. Chapters 3-9 discuss the following topics: home and parent characteristics (family background, home language use, parent interest in education, and relationships among these characteristics); student characteristics (demographic, oral language proficiency, and academic aptitude); the school context (student body characteristics, academic climate, school language environment, provision of relevant teacher training, principal involvement, attitudes of non-language-minority parents, and program exit and entry policies and practices); elements of instructional services (language of instruction, curriculum design, materials, and staff); service clusters and sequences; student academic performance; and "other outcomes." The final chapter summarizes the findings and discusses implications. A 66-item bibliography is included. Appendixes include a glossary, a description of test scores and variables, an explanation of methodology, and technical analyses of two tests. (MSE)

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INSTRUCTING CHILDREN WITH LIMITED ENGLISH ABILITY

YEAR ONE REPORT
OF THE
NATIONAL LONGITUDINAL EVALUATION
OF THE EFFECTIVENESS OF SERVICES FOR
LANGUAGE-MINORITY
LIMITED-ENGLISH-PROFICIENT STUDENTS

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U.S. Department of Education
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INSTRUCTING CHILDREN WITH LIMITED ENGLISH ABILITY

YEAR ONE REPORT OF THE NATIONAL LONGITUDINAL EVALUATION OF THE EFFECTIVENESS OF SERVICES FOR LANGUAGE-MINORITY LIMITED-ENGLISH-PROFICIENT STUDENTS

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The study reported herein was performed pursuant to a contract with the United States Department of Education. However, the opinions, conclusions, and recommendations expressed herein do not necessarily reflect the position or policy of the Department of Education, and no official endorsement by the Department of Education should be inferred.

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PREFACE

This report summarizes the results of data collection during the first year of the three-year Longitudinal Evaluation Phase of the study, "The National Longitudinal Evaluation of the Effectiveness of Services for Language-Minority Limited-English-Proficient Students." This report summarizes the characteristics of the study's students, services and schools. As in any such study, to get the full meaning from initial data it is necessary to wait until follow-up data have been collected so that data from different points in the study can be analyzed with respect to each other. Thus, the present report must be regarded as preliminary and partial, and for the full richness that comes with longitudinal data it will be necessary to wait for the final report based on data from all three years of the study. The data collection and analyses were performed by Development Associates, Inc., in affiliation with the Research Triangle Institute, during the years 1984-1986.

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We also thank the numerous local school principals, teachers, and other administrative personnel who were so cooperative in all aspects of the study. The burden on coordinators of special services and some teachers and administrators was substantial, and the study could not have been completed without their cooperation. The quality of program evaluation ultimately rests on its data, and local school personnel were uniformly willing to help the study achieve its goals. This cooperation is greatly appreciated.

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CHAPTER 1

BACKGROUND AND INTRODUCTION

Chapter 1. BACKGROUND AND INTRODUCTION

Since the late 1960s, the number and diversity of special services provided to language-minority limited-English-proficient (LM-LEP) students have increased tremendously. A constant flow of non-English speaking immigrants as well as passage of the Bilingual Education Act in 1968 and legislative actions in many states and localities have stimulated school districts to increase the number of instructional services specifically designed to meet the educational needs of LM-LEP children. As federal, state, and local government involvement in this area has grown, so too have policy-makers' needs for accurate information on the different kinds of services being provided to LM-LEP students and how they affect these students' performance in all-English-medium classrooms. To address this need for accurate information, in 1982 the U.S. Department of Education funded the "National Longitudinal Evaluation of the Effectiveness of Services for Language-Minority Limited-English-Proficient Students." The study consists of two phases: the Descriptive Study and the Longitudinal Study.

1A A. THE DESCRIPTIVE STUDY

The descriptive phase of this study, carried out by Development Associates between December of 1983 and September of 1984, focused on describing the special, language-related services LM-LEP students receive in public schools in the United States (regardless of the source of funding these services), and on estimating the number of LM-LEP students in grades K-6 receiving special, language-related services.

The Descriptive Study's findings were based on a national probability sample of 19 states, and within them 191 public school districts. Within these districts, data were obtained concerning 520 schools, 4,061 teachers of LM-LEP students in grades 1-5, and 1,665 LM-LEP students in the first and third grades. The data were collected in 1983 by mail questionnaire, telephone interview and site visits. Visits were made to 80 of the study's school districts and to 360 schools within these districts.

The findings from that phase of the study are presented in the report LEP Students: Characteristics and School Services (Young et al., 1985).

1B B. THE THREE-YEAR LONGITUDINAL STUDY AND STRUCTURE OF THIS REPORT

Data collection for the Longitudinal Study began in the fall of 1984. The study's basic plan calls for a three-year study of two cohorts of students (first-graders and third-graders) in a national sample of schools selected from the Descriptive Study. Data collection and tabulation has now been completed for the first of the three years, and this report presents the results.

The goal of the Longitudinal Study is to acquire an understanding of the degree to which educational services provided to language-minority limited-English-proficient (LM-LEP) students in grade levels 1 through 5 are effective in assisting such students to function successfully in all-English-medium classrooms. The major objectives of the study are:

- to determine the degree to which services provided are effective collectively in enabling LM-LEP students in grade levels 1 through 5 to function successfully in all-English-medium classrooms; and
- to determine which clusters of services are most effective under specific conditions.

The focus of the study is on the effectiveness of educational services provided to LM-LEP students, regardless of the source of funding. Thus, the goal of the study extends beyond an examination of services provided by ESEA Title VII. However, it should be noted that a component of the study is to assess the consequences of ESEA Title VII policy and funding on the provision of effective services.

Somewhat more precisely, the objective of the study may be viewed as providing answers to five questions of major concern to Congress, the Department of Education, and educators at the state and local levels. The first question concerns the general effects of special LM-LEP services, irrespective of teaching methods or languages used or the content taught, on the LM-LEP students who receive them. The second question looks at the relative effects of the different special LM-LEP services and combinations of these services ("service clusters") on the recipients. The third question is concerned specifically with English-proficient students who participate in special services for LM-LEP students, while the fourth pertains specifically to LM-LEP students whose parents refuse to permit them to receive special services. The fifth major study question probes consequences of ESEA Title VII policy and funding. The major study questions are presented below.

A. What are the effects of the special services provided for LM-LEP students in grades 1-5 in terms of the LM-LEP student's ability to function effectively in all-English-medium classrooms?

B. How do the various combinations of special services ("service clusters") provided for LM-LEP students in grades 1-5 compare in terms of the effectiveness with which recipients subsequently can function in all-English-medium classrooms?

C. What are the characteristics of English-proficient recipients of special services for LM-LEP students, and how does the receipt of these services affect the academic performance of these students, overall and when analyzed in terms of language background?

D. What are the characteristics of LM-LEP students whose parents refuse to permit them to participate in special LM-LEP services, and how does the non-receipt of these services affect their academic performance?

E. What have been the consequences of ESEA Title VII policy and funding on provision of effective services for LM-LEPs?

The results of the Longitudinal Study will be based on a detailed analysis of the instruction, personal and home characteristics, and academic achievement of a sample of approximately 10,000 first grade and third grade students enrolled in 18 school districts across the United States. An overview of the study's theoretical framework, its design, and how it was implemented in the first year of the study are presented in Chapter 2 of this report.

Part II of the report (Chapters 3-5) provides basic descriptive findings about the study's students and schools. Chapter 3 focuses on the students' home and parent characteristics, and Chapter 4 focuses on student demographics, language proficiencies, and academic aptitude. Chapter 5 describes characteristics and practices of the study's schools.

Part III of the report (Chapters 6 and 7) describes instructional practices from several perspectives. Chapter 6 describes the amount and nature of instruction received by students in the study, the instructional materials they use, and the organization of their learning environment. The focus of Chapter 7 is on particular sets or clusters of services, both at specific points of time and across the entire school year.

Part IV of the report (Chapters 8 and 9) presents data for the study's main outcome measures. Specifically, Chapter 8 deals with student academic achievement and performance, while Chapter 9 treats other types of outcome data collected in Year 1.

The last section of the report, Part V, presents a summary of the most salient findings from Year 1 of the study (Chapter 10) and the implications of these findings for the study's future conduct.

In summary, this report presents the results of the data collection during the first year of the three-year Longitudinal Study. As in any such study, to get the full meaning from initial data it is necessary to wait until follow-up data have been collected so that data collected at different times can be analyzed with respect to each other. Thus, the present report necessarily must be regarded as preliminary and partial. For the full richness that comes with longitudinal data it will be necessary to wait for the final report based on data from all three years of the study.

CHAPTER 2

OVERVIEW OF STUDY DESIGN AND IMPLEMENTATION

Chapter 2. OVERVIEW OF STUDY DESIGN AND IMPLEMENTATION

2A A. INTRODUCTION

The design of the study was developed out of two main conceptual considerations. The first involved an approach to the definition of the types of educational services received by LM-LEP students. In this approach, services for instructional programs are categorized into one of various major sets or clusters of services (we will call them "service clusters"). Essentially, this is a child-centered rather than program-centered orientation to instructional services. This orientation is based on an assumption that children in the same class or instructional program can have quite different instructional experiences because of differences in their native-language and English-language proficiency. In this approach information on the instructional experience of each student is obtained and analyzed separately, thus enabling children in the same classroom to be designated as in different service clusters. By utilizing such an approach we avoid the confusion which is likely when popular but non-specific terms such as "bilingual program," "transitional bilingual program," "ESL program" or "mainstream program" are used.

The second consideration guiding the design of the study was that of a conceptual model for predicting LM-LEP student outcomes. This model was based on the literatures on academic achievement pertaining to monolingual students, language minority students, and bilingual students. The literature review focused particularly on research on: effective schools, effective teaching, second language acquisition, and the academic achievement of language minority students. Based on the literature review a set of major variables was identified, and a conceptual model defining likely relationships among these variables was described. The study's data collection instruments and preliminary analysis plans were then developed from the predictive model.

The purposes of this chapter are to outline and describe these two key aspects of the study's conceptual base, to provide an overview of the study's research plan, and then to describe briefly the implementation of the study's first year in the field. Provided here is information which we believe to be sufficient for most readers to understand the basis for the chapters which follow. Additional detail is available in the appendices and supplementary reports.

2B B. CONCEPTUAL FRAMEWORK

2B.1 THE PREDICTIVE MODEL

It was important to begin the study with an understanding of the types of factors that are related to the academic success of students in general, and of LM-LEP students in particular. An important step in this process was a review of the literature on factors associated with academic achievement of elementary grade level students, literature which for the most part concerns monolingual English-speaking children. This review was then supplemented by a review of literature focusing on the second language acquisition of young children, and a review of the literature on academic achievement of minority students in particular. The findings of the literature review (Zehler, 1983 a,b,c) were summarized and reported within four areas:

- research on school climate and school effects,
- research on instructional and classroom variables,
- research on effects of programs/services, and
- research on family/community/home variables.

Within each of these areas the findings for monolingual English-speaking children were considered in conjunction with additional factors or emphases that relate to the academic achievement and second language acquisition of LM-LEP students.

A second step in developing the model involved a review of previous models of schooling and achievement. Some of these models concern monolingual English-speaking children (e.g., Carroll, 1963; Cooley-Leinhardt, 1975; Bloom, 1976; Wiley and Harnischfeger, 1974), although their implications are certainly not limited to these children. Other models are focused on LM-LEP students (e.g., Tikunoff, 1982; Cummins, 1979; Morine-Dershimer, 1981). The objective of the review was to provide a comprehensive model reflecting the empirical findings and best judgments of prior researchers as a guide for the design and analytic planning of the study at hand.

Results of these efforts directed toward model-building are presented in Tables 2.1 and 2.2. Table 2.1 lists the variables judged to be most important, and Table 2.2 suggests a relationship among the various categories of variables. In the model, the relationships all focus on the effect of instruction on the student's academic performance. While many different interrelationships could be studied, the model provides a convenient way of focusing on the major question of the study: How do school services received by LM-LEP students affect their academic performance in the English language?

2B.2 SERVICE CLUSTERS

For this longitudinal study a Service Cluster is defined as a set of instructional services provided to a particular student over a particular period of time. Two characteristics of service clusters are especially noteworthy. First, insofar as possible, service clusters are based on what programs actually do, on what services are actually received, and not on program goals or official rhetoric. Second, service clusters are child-centered. The focus is on the set of services individual children receive, without regard to whether the same set of services are provided to most or hardly any other children like them in their classroom or by one or more than one teacher.

In the earlier, descriptive phase of this study, data were gathered and services were identified and clustered in a nationally representative sample of schools. The basis for clustering services was both conceptual and

TABLE 2.1. Longitudinal study variables

Family Background

- Socioeconomic status
- Parent's/guardian's education
- Extent of English use in the home
- Home learning opportunities in English
- Parent's/guardian's interest in education

Student Background Characteristics

- Student's age
- Student's prior educational background
- Student's language group
- Student's grade level at beginning of study

Student Language Proficiency and Academic Aptitude

- Intellectual reasoning aptitude
- Oral proficiency in the native language
- Oral proficiency in English
- Proficiency in English language arts
- Proficiency in mathematics

School Background and Schooling Characteristics

- Percent of LM-LEPs in school
- Percent of LM-LEPs in each language group
- Percent of LM-LEPs of the same language group as the student
- School emphasis on academics and basic skills
- Instructional leadership by principal
- Extent of English use by students with instructional staff and peers outside of instructional school time

Instructional Staff/Classroom Characteristics

- Educational background
- Teaching experience in elementary school
- Experience teaching LM-LEP elementary school students
- Philosophy/attitude toward instruction of LM-LEP students
- Instructional staff's proficiency in the native language and in English

Instructional Environment

- Student/teacher ratios
- Grouping practices
- Use of aides
- Coordination of instruction
- Percent of students from same background
- Materials used

TABLE 2.1 (continued)

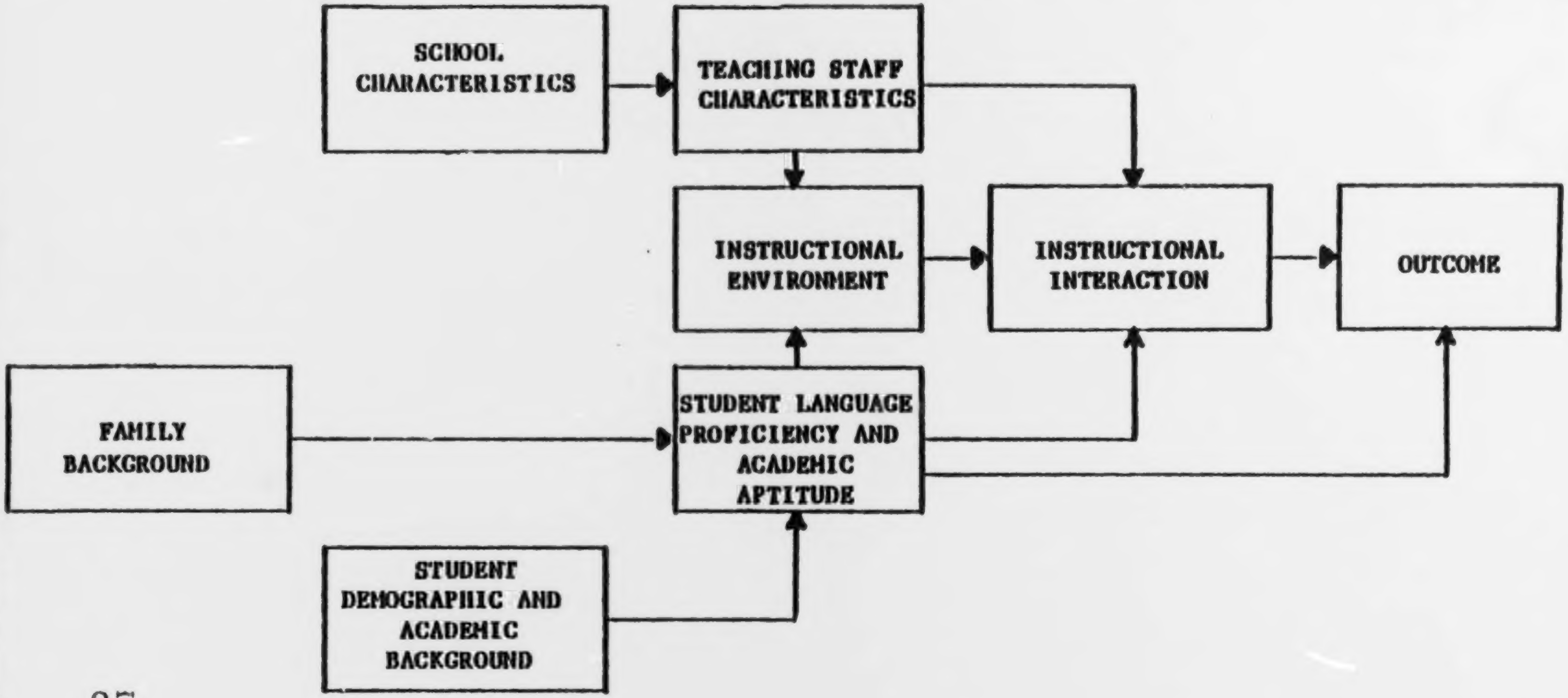
Instructional Services Received

- Total instructional hours in English language arts
- Total instructional hours in math
- Use of the native language for instruction of academic subject areas
- Instruction in native language arts
- Special instruction in English
- Use of simplified English
- Rate of change in use of native language in instruction
- Attendance

Outcomes

- Achievement in English language arts
- Achievement in mathematics
- Teacher ratings of academic performance in English and math
- Teacher ratings of student classroom participation/behavior
- Grade advancement

TABLE 2.2. A predictive model for LM-LEP student academic outcomes


SCHOOL CHARACTERISTICS
TEACHING STAFF CHARACTERISTICS
INSTRUCTIONAL ENVIRONMENT
INSTRUCTIONAL INTERACTION
OUTCOME
FAMILY BACKGROUND
STUDENT LANGUAGE PROFICIENCY AND ACADEMIC APTITUDE
STUDENT DEMOGRAPHIC AND ACADEMIC BACKGROUND

empirical. The variables comprising the clusters were drawn from a literature review of previously developed typologies of services for LM-LEP students and their critiques (e.g. Fishman and Lovas, 1972; Mackey, 1978; Troike, 1981; Krashen, 1981; Baker and de Kanter, 1981; and NCBE, 1985), discussions with practitioners and researchers, and our own knowledge of the field. The manner in which the variables are combined was guided both by the literature and the distributions actually found in the field.

In the Descriptive Study, data were collected only once during the year, and were collected about groups of LM-LEP students within each elementary school rather than about individual students. Based on those data, five basic types or clusters of services emerged:

- Type A--the student's native language (Spanish, Chinese, etc.) is used almost exclusively;
- Type B--there is substantial and continued use of the students' native language and of English for instruction;
- Type C--there is a systematic change from initially predominant use of students' native language to a predominant use of English in instruction;
- Type D--essentially all instruction is in English, but with special instruction in English language arts for LM-LEP students; and
- Type E--all instruction is in English with no special services provided to LM-LEP students.

Table 2.3 provides nationally representative distributional data regarding the clusters of services available to first-grade LM-LEP students from the predominant language minority group within each of the Descriptive Study's schools. Basically the same pattern was found for third-grade students.

For the current Longitudinal Study, minor revisions were made in the service cluster schema used in the Descriptive Study. In the Longitudinal Study it has been possible to obtain detailed information on the instruction received by each LM-LEP student in the study and to gather this information at several points in time. Thus, the service cluster designations for the Longitudinal Study are more precise characteristics of the services received by each of the study's LM-LEP students than are the clusters used in the Descriptive Study.

TABLE 2.3. Percentage of schools and students for typical service clusters for first-grade LM-LEP students from the predominant language-minority group; based on Descriptive Study

Service Cluster Type	National Percentage of Schools	National Percentage of LM-LEP Students*
A. Native Language Primary	3%	7%
B. Continued Instruction in the Native Language and English	11	26
C. Change in Language Instruction	29	40
D. All English with Special Instruction in English	51	25
E. All English without Special Instruction in English	6	1
Total of Primary Clusters	100%	100%

*Column percentages do not add to 100 because of rounding.

The service clusters and the five variables comprising them which are used in the Longitudinal Study are presented in Table 2.4. For the Longitudinal Study, services are categorized into six major cluster groups, including 32 specific clusters. Three of the major clusters (A, B and C) are situations in which the students' native language is used to a significant extent, and three of them not. The three clusters in which only English is used (D, E and F) differ with respect to whether the students receive special instruction in English.

Since the Longitudinal Study data on services are to be collected over three years, it will be possible to determine sequences or patterns of services within and across years for each of the LM-LEP students in the

TABLE 2.4. Instructional service clusters

Cluster Type / Cluster Variable	Extent of Native Language Use in Non-language arts Instruction[a]	Special Instruction in English Provided	Use of Simplified English for Non-language Arts Instruction[a]	Use of Simplified English for English Instruction	Instruction in Native Language Arts
A. Instruction Primarily Using Native Language	High use of the native language				
A1		Yes/no[b]	Yes/no[b]	Yes	Yes
A2		Yes/no	Yes/no	No	Yes
A3		Yes/no	Yes/no	Yes	No
A4		Yes/no	Yes/no	No	No
B. Instruction using Both Native and English Languages Extensively	Moderate use of the native lang.				
B1		Yes/no	Yes	Yes	Yes
B2		Yes/no	Yes	No	Yes
B3		Yes/no	No	Yes	Yes
B4		Yes/no	No	No	Yes
B5		Yes/no	Yes	Yes	No
B6		Yes/no	Yes	No	No
B7		Yes/no	No	Yes	No
B8		Yes/no	No	No	No
C. Emphasis on English, with Some Instruction Using Native Language	Low use of the native language				
C1		Yes/no	Yes	Yes	Yes
C2		Yes/no	Yes	No	Yes
C3		Yes/no	No	Yes	Yes
C4		Yes/no	No	No	Yes
C5		Yes/no	Yes	Yes	No
C6		Yes/no	Yes	No	No
C7		Yes/no	No	Yes	No
C8		Yes/no	No	No	No
D. Instruction Using English, with Special Instruction in English	Minimal or no use of the native language				
D1		Yes	Yes	Yes	Yes
D2		Yes	Yes	No	Yes
D3		Yes	No	Yes	Yes
D4		Yes	No	No	Yes
D5		Yes	Yes	Yes	No
D6		Yes	Yes	No	No
D7		Yes	No	Yes	No
D8		Yes	No	No	No
E. Instruction Using English, with No Special Instruction in English	Minimal or no use of the native language				
E1		No	Yes in at least one column[b]		Yes
E2		No	No	No	Yes
E3		No	Yes in at least one column		No
F. All Instruction in English, with No Special LEP Service	Minimal or no use of the native language	No	No	No	No

[a] Non-language arts instruction includes Math, Science, and Social Studies (including Ethnic Heritage).

[b] Notations used in this table indicate the following: Yes/no - The variable may or may not present;
Yes in at least one column - There is primarily use of simplified English for non-language arts instruction or primarily use of simplified English for English language arts instruction; or there is primarily simplified English in both non-language arts instruction and English language arts instruction.

study. In Chapter 7 we describe various patterns of service clusters which were identified during the study's first year and we designate a set of nine of these as Cluster Sequences. Data analyses are presented both in terms of specific clusters and in terms of patterns of clusters.

Finally, it should be noted that the variables comprising the Longitudinal Study's clusters closely parallel those used in the Descriptive Study. However, the concept of change in the use of a students' native language, which was incorporated in the Descriptive Study's Cluster "C," is now a part of the "cluster sequences," with each of the clusters in the Longitudinal Study defined in terms of the services students receive at a given point in time.

2C

C. OVERVIEW OF RESEARCH PLAN

The basic plan calls for a three-year longitudinal study of two cohorts of students in a national sample of schools selected from those in the 1983-84 Descriptive Study. The three years are: school years 1984-85, 1985-86, and 1986-87.

As shown on Table 2.5, the first cohort, Cohort A, consists of students who were in grade 1 during the first year of the study (1984-85) and who are expected to be in grade 2 the second year and grade 3 the third year. The

TABLE 2.5. Summary of 3-year longitudinal plan

	Grade level of students during	Grade level of most of the students during:	
Cohort	1984-85	1985-86	1986-87
A	Grade 1	Grade 2	Grade 3
B	Grade 3	Grade 4	Grade 5

second cohort, Cohort B, consists of students who were in grade 3 the first year and who are expected to be in grades 4 and 5 during the second and third years respectively. Throughout this report we use grade-level and alphabetic designations for the two cohorts interchangeably. The grade-level designations are more readily interpretable, but since a small number of students had already transferred from grade 1 and grade 3 by the end of the study's first year, the alphabetic designation is slightly more precise. In the second and third years of the study, when there will be much more variation in grade-levels within the two cohorts, the alphabetic designations will be used almost exclusively.

The sample of students was planned to be large enough to allow for expected attrition, and once the students were selected and the rosters closed in the winter of 1984, no cases were added to the sample. Students are not to be dropped from the study merely because they have ceased to be designated as LM-LEP or to receive special services; the plan is to continue following them for the full three years, to see how they fare in an all-English environment. Also, to the extent resources permit, students will be followed and maintained in the study even when they leave the original study schools.

Data are being collected regarding school districts, schools, principals, instructional personnel, and students. The focus of the study, however, is students, not schools or districts. Thus data about districts, schools, and school principals are being used as auxiliary data about those students in the corresponding districts and schools; data about teachers are used as auxiliary data applying to students in those teachers' classes.

The student sample consists of three categories of students. They are as follows:

- LM-LEPs--language-minority limited-English-proficient students (LM-LEPs). These are students officially designated by their schools as LM-LEP during the first year of the study. They may or may not have ever received special language related services. This is the category of principal interest to the study.
- EP/LIS--English-proficient (EP) students who, when the study began, were receiving some instructional services designed for LM-LEP students. This category of students is sometimes referred to as

EP/LIS in this report (English-Proficient/LM-LEP Instructional Services). These students are included in the study in order to make it possible to investigate the effects on achievement level that result from providing bilingual or other forms of LEP instructional services to English-proficient children.

- EP/Comp--English-proficient students who have never been classified as LM-LEP and who have never received instructional services designed for LM-LEP students. This category of English-proficient students is included in the study primarily as a comparison group. This category of students is sometimes referred to in this report as EP/Comp. After longitudinal data have been collected in the second and third years of the study we expect both the LM-LEP and EP/LIS groups will be compared with the EP/Comp group.

Baseline data were collected in the fall of 1984, and a preliminary set of outcome measures were collected in the spring of 1985. The plan is to collect subsequent sets of outcome data in the spring of the second and third years of the study (i.e., Spring 1986 and Spring 1987). The Fall 1984 baseline data and all outcome data except the very last set (Spring 1987) are all to serve as control measures for subsequent outcome measures.

The study was planned with an overlap of the two cohorts at grade 3. A major purpose of this is to provide some information about the extent to which the LM-LEP students in the first-grade and third-grade cohorts are comparable. We know in advance that they do not represent exactly the same population, since by the time the grade 1 LM-LEPs reach grade 3 many of them will have become English-proficient. Such students are represented in our grade 1 cohort during all three years of the study, but they are excluded from the grade 3 cohort, which is defined to consist only of students who were classified as LM-LEP when they were in grade 3. The grade 3 cohort includes some students continuing to receive special services after two or more years of special instruction as well as some students who are new immigrants to this country and therefore began receiving services at an older age than LM-LEP students in the grade 1 group. For analyses in which direct equivalence of the two cohorts is essential, this will be achievable by means of dropping some students from the analysis. Students dropped would include grade 1 cohort students who when they reach grade 3, would not have been eligible for the grade 3 cohort and grade 3 students who would not have been eligible for the grade 1 cohort. This kind of analysis will not be appropriate (or even possible), however, until all the longitudinal data have been collected at the end of three years.

2D

D. THE SAMPLE

The sites for the longitudinal study were a subset of those in the Descriptive Study. In the Descriptive Study, a national probability sample of 200 schools had been selected for intensive site visits, including collection of student-level data and the subsequent determination of the service clusters existing at the schools. The specific schools selected in the sample of 200 and the 80 school districts containing those schools represent the frame from which all the Longitudinal Study districts and almost all of the Longitudinal Study schools were selected.

To minimize student unit costs (by reducing fixed site costs), it was decided to limit the student sample for the longitudinal study to approximately 20 LEAs, and within each of these LEAs to select a carefully chosen subset of schools, rather than necessarily including all of the LEA's schools that were in the Descriptive Study.

Although the principal selection criteria were directed at the school level, one general district requirement was imposed. Specifically, to meet minimum within-district sample size needs for conducting within-site analyses, districts reporting fewer than 200 LM-LEPs altogether in grade 1 or grade 3 (as reflected in responses to Questionnaire No. 1 of the Descriptive Study or in other sources in the absence of that datum) were excluded from further consideration.[1] As a result of the nature of the initial selection procedure, the remaining districts are representative of all districts nationally having total LM-LEP counts of 200 or greater in both grade 1 and grade 3. (Districts previously refusing or otherwise unable to participate were also excluded for obvious reasons.) In accordance with the considerations discussed above it was decided that within geographic region,[1] districts were to be chosen on the basis of the characteristics of the LM-LEP students and the service clusters present in the schools within the district. This implied that districts with greater representation of non-Hispanic LM-LEP students and those with rare service clusters (i.e., Clusters A and E) should be oversampled to allow greater variation in analysis; it also suggested that attempts should be made to provide reasonable representation of cluster types.[2]

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[1] Note that the remaining districts are still representative of all districts nationally having total LEP counts of 200 or greater in grades 1 and 3. These districts represent a national population of districts estimated to contain 74.7% of all public school LM-LEPs in grade 1 and and 75.2% of the corresponding grade 3 students.

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[1] California, Texas, Rocky Mountain, Midwest, Northeast, and Southeast.

[2] An important decision in connection with the sample was whether it must be a purely probability sample. For a purely descriptive or normative study to be dependably accurate, it is virtually imperative that results be based on a probability sample of the population to whom the norms are to apply. It is for this reason that for the Descriptive Phase of the study, the samples of districts, schools, teachers, and students all were true probability samples. For the Longitudinal Study, however, the situation is entirely different. This is essentially a relational study rather than a descriptive study. We are investigating the relation between kinds of services provided and the outcomes of those services for LM-LEP students in general and also for specific categories of such students. For relational studies of this sort, it is of primary importance to have all the important elements of the population well represented, but it does not really matter whether they are represented in the precise proportions in which they are found in the population. This is true because the study is intended to determine what happens within various segments of the population and to compare these outcomes for different segments, rather than to combine them with the goal of getting an overall composite. A central purpose of the study is to compare outcomes for students receiving different clusters of services--rather than to combine these various groups of students to find the outcome for an undifferentiated composite of all groups. Thus, it was judged appropriate to go beyond the Descriptive Study's sample and to supplement the Longitudinal Study with schools which had particular types of services or students important to the Longitudinal Study's design.

2D.1 SELECTING THE DISTRICT SAMPLE

To allow for the inability of some of the selected districts to participate, slightly more districts were included in our initial selection than we planned to have in the final sample. After excluding districts that did not meet the minimum size in terms of LM-LEP population and a few other districts that were known to be unable to participate, Descriptive Study districts in 11 states remained. Together, these states contained over 81 percent of the estimated number of LM-LEP elementary school students in the United States, and represented a range of demographic and geographic characteristics and of state level involvement in the provision of special services for LM-LEPs. An initial sample of districts, including at least one from each of the 11 states was selected. As anticipated not all of them were able to participate and the final sample consisted of 18 districts, located in 10 states. Table 2.6 identifies the districts in the final district sample, and also shows the initial numbers of schools and students included in the study from each district.

2D.2 THE SCHOOL SAMPLE

Schools were to be selected within chosen districts on the basis of similar criteria. Schools containing fewer than 10 LM-LEP students in both grades 1 and 3 were to be excluded from consideration, and schools with greater representation of non-Hispanic LM-LEP students and those with rare service clusters were to be oversampled. Service cluster diversity was desired within and among the chosen schools within a particular district to facilitate within district comparisons.

The need for adequate diversity in the school sample led to the decision that somewhere in the vicinity of 100 schools (plus or minus 20 percent) would be about right.

The final school sample, from the 18 districts, consisted of 86 schools. Almost all of these schools had also been in the Descriptive Study sample. Six schools that had not been in the Descriptive Study were brought into the sample.

TABLE 2.6. Districts in longitudinal study and corresponding numbers of schools and students

STATE	No. of Districts	DISTRICT	No. of schools	NO. OF STUDENTS*					
				Cohort A			Cohort B		
				LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
California	4	Los Angeles	10	1542	367	42	1254	369	54
		San Francisco	5	254	18	35	220	24	29
		Oxnard	3	188	162	29	175	133	31
		Richmond	4	81	57	58	85	32	56
Florida	1	Dade County (includes Miami)	5	320	0	42	178	0	60
Illinois	1	Chicago	6	369	0	64	274	0	57
Massachusetts	1	Boston	6	176	0	51	183	0	52
Minnesota	1	St. Paul	6	120	0	50	90	0	46
New Jersey	1	Newark	4	310	0	38	166	0	31
New Mexico	2	Espanola	5	199	56	0	157	84	0
		Gadsden School District (Anthony, NM)	4	289	81	19	289	88	35
New York	2	New York City District 19	3	154	226	0	81	132	0
		New York City District 30	4	140	0	36	61	7	25
Ohio	1	Cleveland	4	207	0	26	149	0	20
Texas	4	Dallas	4	225	0	47	158	3	41
		Brownsville	4	461	0	16	430	0	16
		San Antonio School District	4	196	30	0	59	23	0
		Edgewood School District (in San Antonio)	5	310	0	0	213	0	0
TOTAL	18		86	5541	997	553	4222	895	553

*Before attrition.

As shown in Table 2.6, the number of schools per district varied from a low of 3 to a high of 10, with the mean at 4.8 and the mode at 4. Table 2.7 shows the representation of native languages within the 86 selected schools.

2D.3 THE STUDENT SAMPLE

As previously indicated, the research plan called for selecting the following three categories of students:

a) LM-LEP students

b) English-proficient students receiving some (or all) instructional services designed for LM-LEP students (EP/LIS)

c) English-proficient students who had never been classified as LM-LEP and had never received the special instructional services designed for LM-LEP students (EP/Comp)

The minimum sample target size was set at 9000 LM-LEP students (divided between the grade 1 and grade 3 cohorts). This was deemed an adequate number to allow for the expected attrition. Virtually all LM-LEP students in grades 1 and 3 in the 86 schools of the sample were selected. The basic exception to the "select all" rule was that LM-LEP students in self-contained special education classes were not included in the study. With this one exception, LM-LEP students were included irrespective of the type of instructional services they received, and all service cluster types (see Table 2.4) are represented in the sample, including students in clusters E and F who receive no language-related services. Including all types of LM-LEP students permits investigating the relationships between types of instruction, characteristics of students, and academic performance.

TABLE 2.7. Distribution of native languages of LM-LEP students in Longitudinal Study sample

	No. of Cases			No. of Cases	
Category	Cohort A	Cohort B	Language	Cohort A	Cohort B
Romance Languages	4779	3621	Spanish	4672	3538
			Portuguese	84	56
			French	1	0
			Italian	6	10
			Romanian	13	12
			French-based Creole	3	5
Other European Languages: Latin alphabet	7	4	German	1	0
			Hungarian (Magyar)	5	1
			Czech	1	0
			Polish	0	1
			English-based Creole	0	2
Other European Languages: Non-Latin alphabet	25	23	Greek	22	22
			Russian	2	0
			Armenian	1	0
			Serbo-Croatian	0	1
Native American Languages	0	12	Tewa	0	9
			Chippewa (Ojibwa)	0	2
			Mayan	0	1
Other: Latin alphabet	104	60	Vietnamese	61	36
			Turkish	1	0
			Malay	1	0
			Filipino (Tagalog)	37	21
			Ilocano	2	1
			Visayan	0	1
			Samoan	2	1
Chinese	221	226	Chinese (unspecified)	179	185
			Cantonese (Toisan)	35	27
			Mandarin	2	3
			Wu	5	11
Other	279	215	Amharic (Ethopian)	1	2
			Afghan (Dari, Pashto, Pushto)	2	1
			Arabic	65	44
			Syriac	0	1
			Bengali	1	0
			Mien	5	10
			Farsi (Iranian, Persian)	5	0
			Hmong	86	70
			Japanese	4	0
			Hindi (and related)	8	3
			Gujarati	0	2
			Punjabi	1	2
			Urdu	4	1
			Korean	64	43
			Lao	7	14
			Cambodian (Khmer)	24	19
			Thai (Siamese)	2	3
Not Known	126	61		126	61
TOTAL	5541	4222		5541	4222

For the EP comparison group, it was decided to select 10-15 students from grade 1 and 10-15 from grade 3 in each school. These students were selected at random from all first and third graders who were never classified as LM-LEP and who had never received LM-LEP services.

In addition all grade 1 and grade 3 non-LEP students in the selected schools who had never been designated by the school as LM-LEP and were receiving LEP services were also selected. These students (the EP/LIS group) were included in order to permit research concerning the effects of LM-LEP instructional services on the academic achievement of students already proficient in English.

The composition of the final sample (before any attrition occurred) was summarized in Table 2.6. Although estimates obtained directly from this sample should not be regarded as population estimates, it will be possible, as explained in Section J of this chapter ("Generalizing from Study Results"), to estimate some population values by using data from the Descriptive Study in conjunction with data from the present study.

2E

E. DATA COLLECTION INSTRUMENTS AND DATA SOURCES

A variety of questionnaires, rating forms, and data recording forms were designed specially for this study. Some were to be completed by the project's field staff; others by the teachers of the students in the sample; and still others by school principals and district-level personnel. In addition, appropriate levels of a commercially published achievement test, the Stanford Achievement Test, were selected for use in pretesting and posttesting student academic achievement; another commercially published test, the Raven Progressive Matrices, was selected to provide a direct measure of a nonlanguage aspect of general academic aptitude; and a rating form, the Student Oral Proficiency Rating (SOPR), was adapted for use in the present study from an instrument which is widely used throughout the state of California to rate students' oral proficiency both in English and in their native language. A list of the instruments and their respondents for each of the three years of the study are presented in Table 2.8.

TABLE 2.8. Data collection instruments

Form	Respondent	Study Year 1	2	3
School District Policy Questionnaire	District staff	X		X
School Statistical Summary Questionnaire	School principal	X		X
School Principal Questionnaire	School principal	X		
School Policies and Procedures Form	School records and principal	X		X
Instructional Staff Questionnaire	All teachers	X	X	X
Student/Teacher Data Form	Main teachers	X	X	X
Student Instruction Record	All teachers	X	X	X
Student Performance Record	Main teachers	X		X
Parent/Home Questionnaire	Parents of LM-LEP students	X		
Student Background Questionnaire	School records and staff	X		X
Student Oral Proficiency Rating: English (SOPR)	Teachers of LM-LEP students	X		
Student Oral Proficiency Rating: Native Language (SOPR)	Teachers of LM-LEP students	X		
Academic Aptitude Measure (Raven Progressive Matrices)				
Coloured Progressive Matrices (CPM)	Grade 1 students	X		
Standard Progressive Matrices (SPM)	Grade 3 students	X		
(Stanford Achievement Tests:				
English subtests:				
Vocabulary	All students	*	X	X
Reading comprehension;	All students	*	X	X
Math subtests:				
Concepts of Number	All students	*	X	X
Computation	All students	*	X	X
Applications	All students	*	X	X

*Fall and spring for Grade 3 students; spring only for Grade 1.

2E.1 RATIONALE FOR OUTCOME MEASURES

Objective measures of student academic performance are virtually essential for a study such as the present one. Therefore, we undertook a review of several of the major achievement test batteries that span at least elementary school grades 1-5. We looked for a battery whose reading comprehension and mathematics applications items were most nearly free of content which might be systematically unfamiliar to students from the various language minority groups included in the study. We also wanted a battery that was not already being used routinely in the schools in the study at a time of the year other than that during which we planned to test. Also, some overlap of the grade ranges for adjacent grades was regarded as desirable, and it was required that the specific subtests or sets of items which the research design called for be available at all the grade levels to be included in the study. The specific subtests we considered important were:

- a measure of reading comprehension;
- a measure of comprehension of oral English;
- a measure of computational ability;
- a measure of ability to solve mathematical "word problems"; and
- a measure of comprehension of mathematical concepts.

Taking the above considerations into account, we decided that the Stanford Achievement Test met our requirements at least as well as any other and better than most. The levels to be used in various grades are shown in Table 2.9. The subtests to be used in each battery are also shown in that table. It may be noted from the table that the Primary 1 level of the test (given in grade 1) combines computation and mathematics applications (i.e., word problems) in a single subtest instead of having them in two separate subtests. This creates no difficulties since it is possible for us to score the two sets of items separately as well as together. Although the tests we are using include none with a title indicating that it is a measure of oral comprehension, the Vocabulary test fulfills this function since each test item is read aloud by the person administering the test.

TABLE 2.9. Stanford Achievement Test levels and subtests to be used

				English Subtests		Mathematics Subtests			
Cohort	Grade	Data Collection Period	SAT Level	Rdg. Comp.	Vocab.	Concepts of No.	Comput.	Math Appl.	Comput. + Appl.
A	1	Spr '85	Primary 1	x	x	x			x
	2	Spr '86	Primary 2	x	x	x	x	x	
	3	Spr '87	Primary 3	x	x	x	x	x	
B	3	Fall '84	Primary 2	x	x	x	x	x	
	3	Spr '85	Primary 3	x	x	x	x	x	
	4	Spr '86	Intermediate 1	x	x	x	x	x	
	5	Spr '87	Intermediate 2	x	x	x	x	x	

In addition to Stanford Achievement Test scores, end-of-year ratings by teachers are being collected on students' achievement in various aspects of English and mathematics. These ratings necessarily have a subjective element which limits their utility as outcome measures for use in making comparisons across school districts. However, they provide a measure of students' relative abilities within their own academic context, and thus are useful indicators of how well such students will perform in all-English-medium classrooms within their own schools.

A third type of measure of student outcome is the rate at which LM-LEP students become designated by their schools as English-proficient. Because schools and districts differ in the criteria they use in defining students as English-proficient (Young, 1985), this potentially important measure must be treated with extreme care. Thus, detailed data on schools' definitions and operational criteria are being collected along with the simple designation of student LM-LEP status each of the study's three years.

2E.2 RATIONALE FOR "CONTROL VARIABLE" INSTRUMENTS

The need for control variables in a study such as this is critical. The term "control variable" as used here refers to a variable that helps prevent distortion of the results that might otherwise occur from different instructional programs as a consequence of differential levels of ability and potential among the students in the groups being compared or other factors extraneous to the focus of the study.

Various different kinds of control variables were deemed desirable. These include a baseline measure of academic ability level independent of the child's language, an evaluation of the child's degree of oral proficiency in English (and where feasible in his or her native language) and a measure of achievement in English and mathematics. Also included here are measures of home context which prior research suggests may confound the effect of the instructional treatment variables of primary interest. The first of these variables (the baseline measure of academic ability) is provided by the Raven Progressive Matrices, the second by the Student Oral Proficiency Rating (SOPR), and the third by the Stanford Achievement Tests; the home context measures are provided by a questionnaire developed specifically for this study. The nature and rationale of these instruments are described briefly below.

2E.2.a The Raven Progressive Matrices

The LM-LEP status of the students necessitated a nonverbal test--or better yet, a nonlanguage test. (A nonverbal test is one that does not require the respondent to read, write, or speak in taking the test, and presumably does not require verbal skills in determining the answers to the questions. A nonlanguage test is one that meets the requirements for a nonverbal test and also meets one additional requirement--that it can be administered entirely without the use of words, e.g., in pantomine.)

There are quite a few nonverbal tests available, but hardly any nonlanguage tests. The Raven Progressive Matrices is the best-known and most widely used of the very few extant. It has been used in countries all over the world; furthermore it has been used with deaf children, speech-impaired children, and LM-LEP children. The Raven has the important advantage that several different levels have been developed, so that there are levels suitable for grade 1 and for grade 3. In this connection another feature is worth mentioning, which, though not a crucial factor in the selection of the Raven, nevertheless constitutes an added plus. This is the fact that 24 of the 36 items in the level used in grade 1 (the Coloured Progressive Matrices) are identical to the first 24 items in the 60-item level used in grade 3 (the Standard Progressive Matrices). Scoring these 24 items separately (in addition to including them in the totals) enables us to compare grade 1 Raven scores and grade 3 Raven scores more directly than would otherwise be possible.

Another consideration in selection of the Raven was that unlike many non-verbal tests of general academic aptitude it would not have to be administered individually. Administering a test individually to every student in the study would have been out of the question in terms of the project budget. But the Raven can be administered to small groups of students. (For the grade 1 students it was generally administered in groups of five to ten students while in grade 3 the groups were as large as 15 students.)

Some readers may wonder why we refer to the Raven as a measure of general academic aptitude despite its nonverbal character and the well-known fact that academic aptitude has a heavy verbal component. The resolution of this seeming paradox lies in the fact that although the test items in the Raven are nonverbal, the ability they measure has been found for English-proficient children to have a high correlation with intelligence tests (even ones that have a heavy verbal component) and thus with general academic aptitude. Thus it can be assumed to be a good measure of the academic aptitude of LM-LEP students, and to be substantially correlated with verbal aptitude. This makes it ideal as a control variable--a variable that can function as a covariate or as a predictor of expected gain in achievement in determining whether the treatment variables (e.g., service cluster and individual variables that characterize the mode of instruction) have a positive or negative effect in comparison with what might be expected in the absence of special instructional services for LM-LEP students.

2E.2.b The Student Oral Proficiency Rating (SOPR)

The Student Oral Proficiency Rating (SOPR) was selected as the instrument to be used for obtaining measures of student oral proficiency in English and in the native language. A primary concern in selecting an oral proficiency instrument was to obtain a measure of oral language proficiency that would indicate the level of the students' ability to speak and to understand speech within everyday classroom situations, as well as within informal speech situations. A further requirement was the selection of an instrument that utilized as naturalistic a testing situation as possible, since many of the students in the study would be new to schooling overall and, in particular, would not have any test-taking skills. A third concern was to utilize an instrument which could be used to measure both English and native language ability in comparable terms for the large number of language groups expected to be represented in the study sample.

The limitations of many available oral proficiency tests were considered a significant problem given these requirements. The tasks used in commercially available tests frequently involve only very limited speaking and understanding skills, or the scoring procedures are limited to a small subset of language skills. The assessment situations required for the tests range from paper and pencil tests to individual interview situations focused on specific activities or on guided discussions. Despite this range in the degree to which the tests provide a naturalistic language use situation, they all require a certain "test-wiseness" (and willingness to speak freely with an unfamiliar person) that many LM-LEP students do not have, particularly in the lower grades. In addition, the range of languages which can be assessed by any one test is not very large. The development of comparable tests of the same nature for assessment of oral proficiency in other languages would be very complex and costly.

The SOPR was found to fulfill all of the above requirements. The SOPR is a rating instrument that is a slightly modified form of the Student Oral Language Observation Matrix (SOLOM), an instrument used in California to assist in student placements. The SOPR possesses the characteristics that were of concern in our selection of an oral proficiency instrument. It is completely naturalistic in that it provides a measure of student proficiency based on actual comprehension and production within formal and informal classroom discourse situations. The data that form the basis of the teacher ratings of student oral proficiency are the numerous classroom discourse situations in which the teacher and the student have used the language of interest. Thus the data used are drawn from extensive daily interaction with the student and are not limited to selected topic areas or selected language skills. Since no specific assessment situation is required for the rating, student reticence or test-wiseness is much less a factor in the ratings. For these reasons, the SOPR ratings are expected to be more valid for the study purposes than any scores obtained through the use of the tests available commercially. Also, the general format of the SOPR is such that it can be used for all language groups, provided that there is a qualified teacher available to rate the student in the native language. The SOPR forms[1]--both the form for English and the form for the native language--consist of five behaviorally anchored five-point scales: (A) Comprehension, (B) Fluency, (C) Vocabulary, (D) Pronunciation, and (E) Grammar. A total score is obtained by adding the five separate ratings, each of which can be any integer from 1 to 5; thus the total score has a possible range from 5 to 25. Our intention, when we decided to use the SOPR, was to rely primarily on these total scores, rather than making heavy use of the ratings on the five individual scales. There were two reasons for this: first, it seemed likely that the intercorrelations among the five scales would be rather high; and, second, psychometric theory suggests that the sum of a set of individual ratings will be more reliable than the individual components, and probably more reliable than a single global rating would be.

As will be seen in Chapter 4 (Section C), where empirical data on the SOPR are presented, our expectations were confirmed by the data. The total score appears to be working very well, and intercorrelations among the five scales were high, with the five separate scales not seeming to provide any more precise information than the total.

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[1] See Appendix B, Section 8 in which the SOPR scales are shown.

However, there is some empirical evidence of a slight but real distinction, at least on the English SOPR, between scale A (Comprehension) and the sum of the other four scales, all of which apply to speaking rather than to listening to speech. Thus, throughout this report where SOPR data are presented they are almost always based on the total scores, although occasionally some tables show data for the "speaking" composite (the sum of ratings on B, C, D, and E) and even for the five separate scales.

One possible concern in the selection of the SOPR was the fact that the student scores depend on ratings by individual teachers. Ratings by teachers are advantageous in that they reflect student oral proficiency in a range of situations over an extended period of time. However, there is a possible disadvantage in that different teachers may base ratings on different standards.

To address this concern, two studies of the SOPR were carried out prior to its use in the study: First, a validity study was conducted in which teacher rating data from California using the SOLOM (the original term for the SOPR instrument) were compared with the results of the Bilingual Syntax Measure I (for Kindergarten and grade 1 students), the Language Assessment Scales I (for grades 2, 3, 4, and 5) and the Language Assessment Scales II (for grade 6 students). The SOPR ratings and the language proficiency test scores on which this study was based were obtained within one month of each other. The correlations of the total SOLOM score ratings with the language proficiency test scores were as follows: kindergarten, .73 (87 students); grade 1, .71 (81 students); grade 2, .52 (93 students); grade 3, .80 (67 students); grade 4, .66 (65 students); grade 5, .57 (77 students); and, grade 6, .70 (80 students). These results show quite high levels of agreement between the two types of scores, particularly given the differences in the nature of the teacher rating versus the language proficiency tests.

Second, a reliability study was conducted in which the ratings given by two teachers for the same set of students were compared. The overall correlation of the two sets of ratings (based on ten teacher rater pairs) was .79. Correlation coefficients for separate teacher rater pairs ranged from .71 to .94, with the exception of one coefficient of .47, based on six cases. These correlations indicated fairly consistent agreement between the two raters for each student and showed that the teachers used similar standards in rating students on the 1 to 5 scales.

2E.2.c The Stanford Achievement Test As a Control Variable

As already discussed, the Stanford Achievement Test was selected as the principal outcome measure. This virtually dictated its use as a control measure as well. However, testing at the start of the longitudinal study (in the Fall of 1984) was only for the third-grade cohort. It was deemed undesirable to test LM-LEP students right at the start of grade 1, since at that early stage in their school careers not only testing but school itself would be unfamiliar to many students. Therefore, for the first-grade cohort we plan to depend primarily on the Raven as a pretest measure, rather than using a combination of the Stanford and the Raven.

The SAT mathematics test for third-graders was translated into Spanish, for use in those few districts in which a translated version was required in order to comply with locally imposed regulations. Three of the Concepts of Number items and one Math Applications item had to be omitted because it turned out not to be feasible, with the resources available, to obtain an adequately precise translation of them which was suitable in all the variations in Spanish which were being encountered. In using the results, an adjustment for the absence of these items will be made by means of equipercentile equating. (This will be done in preparation for the analysis to be done after Year 2 data have been collected. Meanwhile, the small amount of mathematics data based on the Spanish translation have been omitted from the present report.)

2E.2.d The Parent/Home Questionnaire

Having a measure of the home environment of the study's students was judged very important. Characteristics of students' parents and their home surroundings can affect both their proficiency in English and their overall performance in school.

Consequently, a questionnaire was designed and field tested to provide measures of the education level, occupation, and interest in school and education of the parents of the study's LM-LEP students. It was also designed to provide measures of the extent of English and other language use in the students' homes, the extent of reading materials in English and other languages in their homes, and the time students spend reading, doing school work, and watching television.

During the initial data collection visit in the fall of 1984, parents of each of the LM-LEP students were asked to complete the Parent/Home Questionnaire. The parents of each child in the sample were given a copy of the questionnaire printed in their native language and another copy printed in English, and they were directed to complete whichever they preferred. The questionnaire was printed in fourteen languages plus English. Where possible, parents who had difficulty completing the questionnaire were assisted by members of the study's field staff or school personnel.

2E.3 RATIONALE FOR OTHER MEASURES

The other measures used in the study are for the purpose of describing the instructional treatments received by each student, the characteristics of the providers of those treatments, or their educational context. Each of these measures was developed specially for this study. Specifically, these include:

- The Student/Teacher Data Form and the Student Instruction Record--These provide the basic information needed to assign each student to a service cluster. These forms are completed about each student by each of a student's teachers at least two times each year of the study. They provide the number of hours each student is taught particular academic subjects; the proportion of time each subject is taught in English, the student's native language, and a language other than English or the child's native language; and specific characteristics of the instructional process and context, as they pertain to each student separately.
- Instructional Staff Questionnaire--This provides basic information on the personal background and experience of each of the students' teachers of academic subjects. It also provides information about their general instructional approach and philosophy. This form is completed by each teacher of each of the study's students once each year.

- The School Principal Questionnaire--This questionnaire is designed to provide measures both of the characteristics of the study schools and of their principals. The nature and extent of instructional leadership a principal provides may reinforce or detract from the direct effects of particular instructional treatments. This questionnaire is completed once by each principal in the study's schools, with new principals completing forms during the course of the study.

- The School Environment Forms--Several brief questionnaires and record review forms are used to collect statistical data concerning school enrollment and the socioeconomic status and academic performance of the schools as a whole. Similar instruments have been designed for recording school and district level policy and practice with respect to determining LM-LEP status, and to assigning students to special services and exiting them from such services. These forms were completed during the first year of the study and are being updated with each data collection visit.

2E.4 DATA FROM EXTERNAL SOURCES

In addition to the data collected specially for this study, we are also, obtaining from school records, where available, existing test score data of two kinds on the study's students. Scores are being obtained on the version of the Comprehensive Test of Basic Skills (CTBS) which has been translated into Spanish to produce the "CTBS Español." We are also gathering scores on the following language proficiency tests:

- Basic Inventory of Natural Languages (BINL)
- Language Assessment Battery (LAB)
- Language Assessment Scale (LAS)
- Idea Proficiency Test (IPT)

The CTBS and language proficiency test data are for tests administered during spring or fall 1984. Although the data have not yet all been collected and processed, at present we have English-language proficiency test scores for close to a thousand LM-LEP students and CTBS Espanol scores for about 1,500 students. Additional CTBS Español data are now being collected for tests administered in 1985.

The CTBS Español will be useful in several ways. The reading score will enable us to investigate the relation of ability to read Spanish to ability to learn to read English. We also plan to investigate the relation of ability to read Spanish to the relative effectiveness of various service clusters (and service cluster sequences). If the schools that provide the CTBS Español data all used the same level of the test within a cohort, we shall be able to combine all districts in a single analysis for each of these investigations. Otherwise, we shall handle the investigations as a series of "mini-studies," each based on a separate district or subset of districts, with appropriate meta-analytic techniques used to combine the results.

The principal role of the English-language proficiency tests will be to provide a supplementary measure of initial ability in English for those third-grade students who did not take the English tests in the Stanford Achievement Test battery in the fall of 1984. Again the "mini-study with meta-analysis" approach can be used, if needed, to avoid combining different tests and different test levels in the same analysis.

2F F. LINKAGE BETWEEN OUTCOME MEASURES AND CONTROL VARIABLES

In Sections E1 and E2 above, outcome measures and control variables are discussed. In the present section we outline the plan for using them together in data analysis. The general plan is built around the goal of the study, which is to acquire an understanding of the degree to which educational services provided to LM-LEP students in grades 1-5 are effective in assisting them to function successfully in an all-English-medium classroom. The effects of various types or clusters of services over time are of particular interest.

We expect to rely primarily on multiple regression analyses to study the effects of various service clusters and related variables. The primary objective will be to explain differences in the third-year SAT scores among groups of students, looking particularly at the extent to which group differences can be attributed to students' exposure to different types of instruction.

Attributing differences in performance levels to particular instructional services involves systematically controlling for competing explanations of differences among the student groups. In the context of this study, factors which should be controlled include students' academic aptitude, their initial proficiency in English, their prior knowledge of the area being tested, and various other student and contextual characteristics.

Controlling these factors means obtaining as good a measure as possible of each factor, and unless they are essentially invariant regardless of the specific instructional program, they should be measured at a point just prior to implementing the instructional programs being evaluated. The theoretical assumption being made is that if the control measures are sound and inclusive, any differences in the end-point SAT scores should be due to the varying effects of the instructional programs received.

In the real world of field research, one does not actually expect to control 100 percent of the possibly important control variables perfectly. Researchers are, however, obligated to control as many as they can to the best of their ability and resources.

Table 2.10 summarizes major outcome analyses that are planned, and the predictive, control, and criterion variables we expect to use. Column 4 lists various instruments that will be the source of control variables (covariates). In some analyses these variables may be used as auxiliary predictors rather than as covariates, but the principal predictor variables will almost always be instructional treatment variables of one kind or another. In many analyses, but certainly not in all of them, the treatment variables will be service clusters. In other analysis the predictors will be some of the component variables used in defining the clusters. Essentially, the design will involve looking at the relative effects of various instructional treatments over three years, including analyses of effects by year or combination of years. More specifically, we expect to analyze the data in terms of first year effects, second year effects, third year effects, and the effects of years 1 and 2 combined, 2 and 3 combined, and of 1,2 and 3 combined--the latter being the most important.

TABLE 2.10. Predictors (or covariates) and criteria for measuring effects of treatment in various grades and grade sequences

(1) Effects of treatment in:	(2) Cohort	(3) Data analysis set[a]	(4) Cases to be included in possible data analysis Cases with SAT criterion variable and	(5) SAT Criterion
Grade 1	A	A1	Raven, SOPRs, parent questionnaire, etc.	Primary 1, Spring 85
Grade 2	A	A2a A2b A2c	Raven, SOPRs, parent questionnaire, etc. Spring 85 SAT Both	Primary 2, Spring 86
Grade 1-2	A	A3	Raven, SOPRs, parent questionnaire, etc.	Primary 2, Spring 86
Grade 3	A	A4a A4b A4c	Raven, SOPRs, parent questionnaire, etc. Spring 86 SAT Both	Primary 3, Spring 87
	B	B1a B1b B1c	Raven, SOPRs, parent questionnaire, etc. Fall 84 SAT Both	Primary 3, Spring 85
Grades 2-3	A	A5a A5b A5c	Raven, SOPRs, parent questionnaire, etc. Spring 85 SAT Both	Primary 3, Spring 87
Grades 1-3	A	A6	Raven, SOPRs, parent questionnaire, etc.	Primary 3, Spring 87
Grade 4	B	B2a B2b B2c	Raven, SOPRs, parent questionnaire, etc. Spring 85 SAT Both	Intermediate 1, Spring 86
Grades 3-4	B	B3a B3b B3c	Raven, SOPRs, parent questionnaire, etc. Fall 84 SAT Both	Intermediate 1, Spring 86
Grade 5	B	B4a B4b B4c	Raven, SOPRs, parent questionnaire, etc. Spring 86 SAT Both	Intermediate 2, Spring 87
Grades 4-5	B	B5a B5b B5c	Raven, SOPRs, parent questionnaire, etc. Spring 85 SAT Both	Intermediate 2, Spring 87
Grades 3-5	B	B6a B6b B6c	Raven, SOPRs, parent questionnaire, etc. Fall 84 SAT Both	Intermediate 2, Spring 87
Grades 1-5[c]	—	C		

[a] Cases in the various data analysis set numbers for a particular grade overlap. For instance, analysis A2a includes all cases with Raven, whether or not they have Spring 85 SAT. Analysis A2b includes all cases with Spring 85 SAT, whether or not they have Raven. Which of the analyses are done for each grade combination will depend on comparative numbers of cases.

[b] This column shows the variables that might be used as predictors or covariates. These combinations of variables are subject to change, depending, for instance, on numbers of cases.

[c] Effects of treatment in the grade 1-5 range can by synthesized by combining equivalent subsets of Cohort A and Cohort B.

It will be seen from Table 2.10 that the design relies on Raven, language proficiency, and home characteristics as the only controls for first graders for Year 1 and all subsequent sequences of years that include Year 1 (i.e., Years 1 and 2, and Years 1, 2 and 3). The SAT, it will be recalled, was not administered in the fall of 1984 because it was felt to be inappropriate to give an achievement test to children so early in their school careers. For third-graders (Cohort B), we do have SAT pretest scores for Year 1, and these will be used in addition to the same controls as will be used for Cohort A. For third-graders SAT pretest scores for Year 1 will also be used. For analyses of the effects of Years 2 and 3, the design provides for using the SAT scores as control variables for both cohorts.

Thus, in summary, there will be a large number of discrete analyses, most of them involving multiple regression analysis with various instructional variables used as the primary predictors, and involving a multiplicity of control variables to cancel, insofar as feasible, the effects of differences in the students' abilities, knowledge, and other important background factors that existed before the instructional procedures being studied were applied. The principal criteria used in most of these analyses will be various Stanford Achievement Test scores as indicated by Column 5 in Table 2.10.

2G G. COMPOSITE VARIABLES

Before the data analysis was begun, a number of composite variables were developed, in most cases by combining on an a priori basis selected questionnaire items dealing with the same general topic.[1] Formation of many of the composites[2] began at the time the questionnaires and rating scales were being developed. Using a composite of several questionnaire items dealing with the same general area, rather than using the individual items themselves, has at least two advantages. First, the composite (a weighted or unweighted sum of several items) is likely to be more reliable than any of the individual items; and second, using a composite often makes the findings more comprehensible and easier to interpret.

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[1] In a few cases the composite was formed by combining ratings on rating scales, or scores on tests, rather than responses to questionnaire items.

[2] These composites are generally described briefly at the point in the report where their use in data analysis is reported. Some are described in somewhat more detail in Appendix B.

When a composite is to be developed, it is necessary to decide whether it should be done on an a priori basis or empirically. A wide variety of statistical methodologies exist for developing composites empirically (e.g., multiple regression, multiple discriminant analysis, factor analysis), but in a study such as the present one there are sound arguments against each of them.[1] A priori composites have the advantages of greater comprehensibility, convenience, and credibility, and they have an additional advantage in that they make better use of available data, since they do not require a set-aside subsample. Thus, this approach, rather than a more empirically driven one, was adopted for developing most of the composites presented in this report.

2H H. SCORING OF TESTS

Because the present study is self-contained, incorporating its own control variables, it is not dependent on published norms in order to evaluate results. This gives us the liberty to modify the scoring procedures used by the test publishers in standardizing their tests where we have reason to believe that the modification may increase the validity and usefulness of the results. We have taken advantage of this circumstance to make some minor, but we think useful, changes. It should be noted that implementing these changes will not impair the results in any way, since in addition to obtaining scores by the modified procedures we have also obtained the conventional set of rights scores. These latter will serve a useful purpose, in that they will make it possible to use publishers' norms.

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[1] Some of the difficulties with using empirical composites in the present context are as follows. Many of the multivariate approaches, such as multiple discriminant analysis, typically yield composites which are not readily understandable, and this is particularly true when, as is often the case, the composites turn out to be bipolar functions. Also, some of the multivariate procedures require a well defined, well measured, and appropriate external criterion, but one may not be available, or it may be focused on just one of several potential uses of the composite. Moreover, in the case of statistical procedures, such as multiple regression, multiple discriminant analysis, canonical correlation, and other multivariate procedures involving some form of correlation, capitalization on chance may significantly distort findings unless the composite is determined on the basis of a subsample which is then excluded from subsequent research utilizing the composite. With a priori composites this problem, with the concomitant reduction in the number of cases available for use in the main body of the research, does not occur.

2H.1 KINDS OF SCORES

Both the Stanford Achievement Tests (SAT) and the Raven Progressive Matrices are normally given scores equal to the number of items answered correctly (hereafter referred to as "rights scores"); among items not answered correctly, no distinction is made between omitted items and items answered incorrectly. This mode of scoring a multiple-choice test assumes that every student answers every item. When that assumption does not hold, the child who omits items if he or she is uncertain of the answer is penalized inequitably; the child who makes a guess on all such items will probably get about a third of them right purely by chance if they are three-choice items, a fourth if they are four-choice items, etc., while the child who omits deprives himself of this advantage. One way of handling this problem is to "correct" the rights scores for omitted items by adding to the score the estimated number of items the child would have gotten right by chance had he made a guess rather than omitting the item. We choose to call the score obtained this way the "adjusted score."

In our judgment using adjusted scores is superior to using rights scores. To express this judgment in somewhat more technical terms, adjusted scores tend to give a more valid indication of the student's level of knowledge or ability than do rights scores. If none of the examinees omits any items, it makes no difference which mode of scoring is used, because the rights score and the adjusted score are exactly equal; but to the extent that children differ in their tendency to omit items when they do not know the answer, it can make a big difference. Because using adjusted scores instead of rights scores has no effect (and therefore can have no ill effect) when no items have been omitted, and because it can represent a major improvement--an increase in fairness--when items have been omitted by some children while other children have answered every item, whether they know the answer or not, we decided to use adjusted scores as the principal scores for both the Stanford Achievement Tests and the Raven. However, as indicated above, we decided to also make a record of the rights scores, to permit comparison with the norms developed by the author or publisher.

As has been implied, rights scores have been used as the basis for norms and other statistics provided by the test publishers or authors. Those who prefer rights scores base their preference on the belief that in scoring tests by hand it is easier to obtain rights scores than adjusted scores, and that on theoretical grounds it does not make much difference which kind of score is used since the correlation between them is typically very high. However, in the present case all scoring is done by computer, and even when the correlation between rights and adjusted scores are very high, there are still likely to be some children who omit large numbers of items, which can substantially distort the results not only for the children affected but for research analyses that include these scores. Thus in subsequent chapters and in subsequent years when we report data involving test results, those data, except where indicated to the contrary, will be adjusted score data.

2H.2 SETS OF VARIABLES SCORED

As was shown in Table 2.9, there is a slight difference between the list of tests from the Primary 1 SAT battery that are included in the study and the corresponding lists from the other four levels--Primary 2, Primary 3, Intermediate 1, and Intermediate 2. In the latter four levels the following tests are used:

Vocabulary
Reading comprehension
Concepts of number
Math computation
Math applications

In the Primary 1 battery, on the other hand, the last two of these five areas are combined in a single test, "Mathematics Computation and Applications." To facilitate comparison of results from grade to grade, we have scored the 22 Primary 1 computation items and the 23 applications items separately as well as together; and in the other four batteries we have obtained a combined score for these two tests as well as scoring them separately.

For somewhat similar reasons we have also slightly expanded the set of scores obtained for the Raven. The Raven Standard Progressive Matrices (SPM), which is given in grade 3, consists of five sets of 12 items each--Sets A, B, C, D, E--Set A being the easiest and Set E the most difficult. The Coloured Progressive Matrices (CPM), given in grade 1, consists of three sets of 12 items each--Sets A, AB, and B. Sets A and B are identical to the like-named sets in the SPM except that in the CPM the items are colored. Since the sole function of the coloring is to serve as an attention-grabber for the very small children for whom the CPM is intended, and since the colors provide no clue to the answers, we obtained separate scores for A+B in both the CPM and the SPM. The purpose is to facilitate direct comparison between grades 1 and 3 on an identical set of Raven items.

Table 2.11 summarizes the scores obtained and other miscellaneous information about the Raven and SAT tests.

2I I. IMPLEMENTATION IN YEAR 1

During the first year of the study at least four visits were made to the 18 school districts. The first visit took place in the fall of 1984. Its purpose was to familiarize school principals and staff with the study, to compile rosters of the study students, to identify teachers and support staff working with study students at each school, and, where required, to send home parent permission forms. Following the initial visit, three other visits were made to all 86 participating schools to collect data. These visits were in the fall, winter, and spring.

TABLE 2.11. Miscellaneous information about Raven Progressive Matrices and Stanford Achievement Tests used in Year 1

	Kinds of Score Obtained*	No. of Options Per Item	Number of Items		
Raven Progressive Matrices					
Coloured (CPM)					
Sets A + B	A R I	6	24		
Set AB	A R I	6	12		
Total (A + AB +B)	R I	-	36		
Standard (SPM)					
Sets A + B	A R I	6	24		
Sets C + D + E	A R I	8	36		
Total (A + B + C + D + E)	R I	-	60		
	Level⟶	Primary 1 2 3	Primary 1	Primary 2	Primary 3
Stanford Achievement Test					
English					
Vocabulary	A R I	3 3 4	38	35	38
Reading Comprehension	A R I	3 4 4	40	40	60
Total	I	- - -	78	75	98
Math					
Concepts of number	A R I	4 4 4	34	34	34
Computation	A R I	4 5 5	22	38	42
Applications	A R I	4 5 5	23	36	38
Computation + Applications	R I	- - -	45	74	80
Total	R I	- - -	79	108	114
Total (English + Math)	I	- - -	157	183	212

*Code for "kind of score"
A = No. of items attempted
R = No. of items right
I = adjusted score

2I.1 FIELD OPERATIONS

Field work in each of the study's 18 school districts was the responsibility of a team leader who was assigned to one or more of the study sites. The team leaders are senior-level, full-time Development Associates employees or consultants with extensive experience conducting educational research with LM-LEP students in elementary schools. They handled all communications with the district and local school officials, as well as locating, hiring, and supervising local professional and paraprofessional data collectors. Up to nine local professionals per site were employed during the fall. Their primary responsibility was to assist the team leader throughout the data collection process in updating the student and teacher rosters and in gathering the teacher data. Paraprofessionals were generally aides or clerical staff at the study schools. They were employed mainly to assist in the collection of student background information from school records, and to help send out and keep track of parent questionnaires.

The fall data collection visits by the team leaders and data collectors took place between early October and late December. The fall data collection required an average of two weeks per school district. The winter site visits were conducted in late January and early February with data collection teams spending an average of one week per school district. The spring round of site visits to all 18 participating districts began in mid-April, and was completed by early June; approximately two weeks were spent at each site.

The primary tasks of the fall data collection were to confirm which students were to participate in the study, to collect baseline measures, and to collect initial descriptions of student instructional treatments. More difficulties were encountered in determining which students were to participate in the study than expected. Many schools do not complete the process of designating which students are and are not LM-LEP until well into the school year; frequently preliminary designations are made which are altered on the basis of further testing and classroom performance during the first two or three months of school. As a result, fall data collection was completed on the basis of the best information available through the schools. However, additions and deletions to the study's student sample were made through the end of the winter data collection on the basis of school-based reclassification decisions.

More specifically, the data collected in the fall included: ratings of students' oral proficiency in English and their native language, information about students' parental and home characteristics, and descriptions of the instructional treatments each student received. In addition, measures of academic aptitude (using the Raven Progressive Matrices) and of academic performance (using the Stanford Achievement Test) were obtained from third-grade students. During the winter visit, a second description of the instruction being received by each student was obtained, as was the baseline measure of academic aptitude for first-graders. The spring data collection included: a third description of each student's instructional treatment, the administration of the Stanford Achievement Tests to all study students, and teacher ratings of each students' academic performance in English and math. In addition, data were collected on the salient characteristics and practices of each study school and on the background and approach of each of the students' teachers. A more detailed description of the administration of the study's data collection instruments is provided for interested readers in Appendix C of this report.

In sum, all essential aspects of the first year of field operations were carried out in accordance with the study's plans, and the data from Year 1 needed to implement the analytic plan were successfully obtained. There were, of course, changes in detail, and in retrospect the burden on some schools and teachers and on all the data collection staff, especially during the fall site visit, was substantially greater than anticipated. Nevertheless, and despite some taxing moments, all schools continued with the study throughout the year, and all which continue to have study students enrolled are fully participating in Year 2.

2I.2 CONTENDING WITH STUDENT MOBILITY

It was known from the outset that many LM-LEP students are quite mobile. This student population includes children of migrant farm laborers, recent immigrants, and other low income families who change places of residence a great deal. Also included, however, are rather large numbers of quite stable families, and data from the Descriptive Study indicated the LM-LEP students in the Longitudinal Study's schools might not be as transient as we had feared.

Nevertheless, the plan provided for tracing students who moved out of the original 86 schools, and for trying to gather data about the type of instruction they receive and their academic performance in their new schools. Staff in the study's schools were provided with pre-stamped and addressed postcards which they were asked to complete and return whenever a student in the study transferred from their school. The cards provided the name and address of the school to which the student was transferring. In addition, during the winter and spring data collections the field staff attempted, on a more personal basis, to determine where each student no longer enrolled at a study school had gone.

By fall of Year 2, approximately 12 percent of the LM-LEP students were no longer in the original school districts. Indeed, by the spring of the study's first year, students from the original 86 schools had transferred to 434 additional schools somewhere within the U.S. which we could specifically identify, and an unknown number of other schools as well. By the fall of Year 2, students in the study were known to be in 586 schools within the original 18 study school districts, with 113 of those schools having nine study students or more. These 113 schools are being visited and otherwise fully incorporated in the study in Year 2. Table 2.12 summarizes the number of students ever in the study, the number active in spring 1985, and the number active in the 113 visited Year 2 schools.

Following spring data collection, contact was made with the schools then enrolling students from original study schools for whom we had two of the three following baseline measures: SOPR scores, a Raven score, and SAT scores. There were only 188 such students, all of whom were third-graders. The principals of the schools enrolling these students were asked to have the transferred student's main classroom teacher complete a brief questionnaire providing basic information on the type of instruction provided to the child and rating the child's performance in reading and math. Data were returned on only 47 (25 percent) of these students.

TABLE 2.12. Student mobility during Year 1

		Ever in Study	Spring 1985: In 86 Original Schools		Fall 1985: In Main Study Schools[a]	
	Grade	No. of Students	No. of Students	Percentage[b]	No. of Students	Percentage[b]
LEP	1	5,541	4,839	87.3%	4,568	82.4%
	3	4,222	3,748	88.8	3,485	82.5
Total LEP		9,763	8,587	88.0	8,053	82.5
EP/LIS	1	997	885	88.8	780	78.2
	3	895	831	92.8	718	80.2
Total EP/LIS		1,892	1,716	90.7	1,498	79.2
EP/Comp	1	553	485	87.7	443	80.1
	3	553	489	88.4	419	75.8
Total EP/Comp		1,106	974	88.1	862	77.9
Total		12,761	11,277	88.4%	10,413	81.7%[c]

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[a] There were 113 main study schools in Fall 1985. These were schools located within one of the study's 18 school districts which enrolled 9 or more study students in September 1985.

[b] Percentages are based on the number of students ever in the study.

[c] An additional 782 students were known to be enrolled in other schools in the 18 study school districts (for total of 11,195 or 87.7% of those ever in the study). During Year 2 a limited amount of data is being collected about these students.

2I.3 COMPLETENESS OF YEAR 1 DATA

Determining appropriate response rates for the various data collection instruments used during Year 1 is complex. As has been discussed, the student sample was somewhat in flux through the winter data collection. Consequently, some data were collected on students who were subsequently determined to be outside the proper scope of the study; conversely, it was necessary to make special provisions to collect data on students added to the sample after the planned use of an instrument was done. The factor of student mobility complicates the matter further. At the time of spring data collection there were many students no longer at the original 86 study schools from whom no data could be obtained, although some of these students were in known schools and others may well return to their original school and thus for some purposes are potentially still in the study. A final important consideration is the unit of analysis to be used. The instructional variables most central to the study were provided on each student by one or more of a student's teachers, with teachers having widely varying numbers of students about whom they were to respond. Thus, the failure to obtain data from a single teacher can adversely affect the analyses possible for from one to 50 students; and, therefore, the most relevant data response unit is not the number of teachers successfully contacted, but the number of students about whom data were obtained.

Table 2.13 presents the number of student-level data collection instruments obtained during Year 1. In preparing the table we elected not to present "response rates," but rather to provide two potentially useful bases on which rates could be computed, if desired: the number of students ever legitimately in the study and the number enrolled in the original 86 study schools at the time of data collection in spring 1985. The important analytic issue for this study, however, is the number of respondents in particular categories, not the percentage of responses obtained.

If for some reason percentages are calculated using the data in Table 2.13, it should be noted that using the "ever-in-study" numbers as a basis may result in including students in the denominator who were not enrolled in study schools at the time of data collection and, therefore, for whom no data could have been collected.[1] Some of these students probably will, however, return to their home schools and thus reenter the study. On the other hand, using the "spring 1985" numbers as a basis may result in including in the numerator responses for students who were not enrolled in the original study schools in the spring.

The number of completed Stanford Achievement Tests (SAT) deserves a special note. During the design of the study it became apparent that officials in some of the study's school districts would require that their teachers be given an opportunity to exclude students from SAT testing in Year 1 of the study who the teachers believed knew little or no English. These officials believed that forcing non-English-speaking elementary school students to take an examination in English serves no useful purpose and might do the students psychological harm. As a result, our analysis plans were made assuming we would be prohibited from testing many such students, but our data collection efforts included trying to pursuade all teachers to permit all of their students to take the tests.

As indicated in Table 2.13, the number of completed SATs from the fall testing of third-graders ranged from 66 percent of those ever in the study for the English Vocabulary subtest to 74 percent for the Concepts of Number subtest. In the spring, the percentage tested of those students still in the study's schools ranged from 62 percent (Vocabulary subtest) to 86 percent (Computation and Applications subtest) for first-graders and from 78 percent (Vocabulary subtest) to 92 percent (Computation subtest) for third-graders. As these data show, most students completed all of the study's SAT subtests, but many students were excused from some subtests and not from others. Because the excused students were presumably those with the lowest ability in English and thus of particular interest to the study, an assessment was

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[1] For example, a completed student performance record was sought from teachers only about students in the original study schools in the spring, and thus for most purposes the appropriate response rate would be 94.5 percent (using the number of students in the original schools in the spring), even though forms were obtained on only 83.5 percent of the students who were ever in the study.

TABLE 2.13. Response coverage at the student level for key instruments used during year 1

Instrument	Unit of Analysis	Number Ever in Study		Number in 86 Original Schools in Spring '85		Number of Responses	
		Grade 1	Grade 3	Grade 1	Grade 3	Grade 1	Grade 3
1. Raven Progressive matrices	All students	7091	5670	6209	5068	5873	4017
2. SOPR:English	LM-LEP students	5541	4222	4839	3748	4612	3568
3. SOPR:Native Language	LM-LEP students	5541	4222	4839	3748	4182	3129
4. Parent/Home Questionnaire	LM-LEP students	5541	4222	4839	3748	4621	3556
5. Stanford Achievement Tests (Fall 1984):*							
• Vocabulary	All 3rd graders	—	5670	--	5068	--	3746
• Reading	All 3rd graders	—	5670	--	5068	—	3835
• Concepts of No.	All 3rd graders	—	5670	--	5068	—	4204
• Computation	All 3rd graders	—	5670	--	5068	—	4118
• Application	All 3rd graders	—	5670	—	5068	—	4118
6. Stanford Achievement Tests (Spring 1985):*							
• Vocabulary	All students	7091	5670	6209	5068	3837	3931
• Reading	All students	7091	5670	6209	5068	4155	4195
• Concepts of No.	All students	7091	5670	6209	5068	5213	4566
• Computation and Applic.	All 1st graders	7091	—	6209	--	5312	--
• Computation	All 3rd graders	—	5670	—	5068	—	4653
• Application	All 3rd graders	—	5670	—	5068	—	4190
7. Student Performance Record	All students	7091	5670	6209	5068	5906	4745
8. Student Instructional Record	All students	7091	5670	6209	5068	6785	5481
9. Instructional Staff Questionnaire	All students	7091	5670	6209	5068	6680	5366

*Some teachers who assessed their students as knowing virtually no English refused to allow their students to be tested; those students for whom other data confirm the teacher judgment will be assigned randomized chance scores for some analyses.

made of the representivity of the data which were obtained. Essentially, that assessment showed that there were large enough numbers of students tested in all language proficiency and service cluster categories to make the comparisons called for in the study's analytic plan.

2J J. GENERALIZING FROM STUDY RESULTS

If the findings of a research study are descriptive of just the children on whom they are based and are not generalizable in any way to the larger population beyond, the research is not particularly useful. Thus, it is important to assess the extent and manner in which it will be possible to generalize from the outcomes of the present study. To address this issue it is necessary to distinguish between a "normative study," such as the Descriptive Study, and the present Longitudinal Study whose primary purpose is to discover relationships. Each provides a basis for generalization, but in somewhat different ways.

In a normative study the primary purpose is to describe the population as a whole. Although occasionally some relationships may be highlighted by a cross-tabulation, it is not the usual practice to focus on micro-segments of the overall population. In a relational study, on the other hand, the focus may be on many very small and relatively homogeneous groups of students. To generalize within these homogeneous groups is not only feasible but for many purposes more useful, because the results yielded on the smaller but more homogeneous groups are more sharply focused than generalizations to the population as a whole.

Because the Descriptive Study was essentially "normative," it was essential that the sample on which it was based qualify as a true probability sample--which it was. Thus, after proper weighting of its cases, it yielded distributional data which could be inferred to apply to the LM-LEP population in the nation as a whole. Furthermore, results based on any segment of the sample were generalizable to the larger population corresponding to the segment. But the Descriptive Study could not indicate which methods of teaching LM-LEP students worked best over several years' time--and on which categories of such students each method worked--because it was not a longitudinal study and that was not its purpose. The outcomes of the present study, on the other hand, will, it is hoped, reveal what instructional methods work for various specific and relatively homogeneous segments of the LM-LEP population.

That is, the present study is basically "relational." Its purpose is not the development of distributions or norms but the determination of relationships (e.g. the relationship between the nature of the student's native language and the effectiveness of a specific cluster), and to answer such questions as: What methods are effective for high-ability LM-LEP students from middle-class backgrounds whose native language is Spanish? Or, what methods work for Asian students who are very recent arrivals in this country? Generally, the more specific the segments of the sample, the more useful the results will be, and it is our plan to study segments which are as specific as the limitations imposed by numbers of cases available will permit. It will then be possible for users--e.g., specific school districts and specific schools--to apply specific results to the corresponding segments of their student bodies. They can find out what instructional methods work well for students who are most like theirs. This information should be useful, for example, in deciding what service clusters should be offered in a particular district or school. And in schools whose fiscal and human resources are sufficient to permit offering more than one cluster, the study's findings should help to assign students optimally.

Within certain constraints it will also be possible to make nationwide generalizations on the basis of the study's findings, even those from what may at first appear to be a lot of small, fairly homogeneous population groups.[1] Through some reanalyses of the Descriptive Study data it is possible to tell what proportion of the LM-LEP population is represented by each of the segments into which the study's data have been split. The segments can then be weighted appropriately and the findings combined on them to get a picture of the overall situation nationwide. In other words, even though the Longitudinal Study sample is not, strictly speaking, a probability sample of LM-LEP students, we shall be able to capitalize on the fact that the Descriptive Study sample was. Using distributional and other data from that study we shall be able to recombine the various segments of the Longitudinal Study sample to synthesize a true probability sample.

Thus, for instance, we shall be able to determine not only how the service clusters are distributed nationwide but also whether any particular cluster is overwhelmingly superior to competing approaches. This may not turn out to be the case, of course; and if it does not we shall be able to describe the situations in which one cluster is superior to another and the situations in which different clusters work equally well. The important point overall, however, is that the findings of the Longitudinal Study will be generalizable in ways that will help local schools best tailor their instruction and in ways that will be useful to those concerned about policy and practice at the national level.

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[1] The Longitudinal Study's sample was limited to school districts with over 200 LM-LEP students altogether in grade 1 or grade 3, and to schools within such districts with 10 or more LM-LEP students in these grades combined. Thus, strictly speaking, generalizations should be limited to those types of schools and districts--i.e., schools in districts with relatively large numbers of LM-LEP students in elementary school grades. However, such districts include an estimated 75 percent of all first and third grade LM-LEP elementary school students nationwide. Moreover, although the Descriptive Study data indicate that school districts with few LM-LEP students offer service cluster types D, E and F almost exclusively, these clusters are well represented in the Longitudinal Study, and, at this point, we see no reason why the study's results should not apply equally well to such clusters in those schools.

CHAPTER 3

HOME AND PARENT CHARACTERISTICS

Chapter 3. HOME AND PARENT CHARACTERISTICS[1]

3A A. INTRODUCTION

The focus of the Longitudinal Study is on special services provided by schools to LM-LEP students and on the academic outcomes of those services. The design of the study includes the assumption, however, that the home environments from which students come can also significantly affect academic outcomes. Thus, it was considered to be important to collect data concerning home environments both to examine the independent effects of home and parent variables on academic outcomes and to study the interaction of those variables with effects related to school services.

The data for this chapter come from the Parent Questionnaire which was sent home with all LM-LEP students in the study. The results are based on the 8177 responses to the questionnaire, which represent approximately 85 percent of the LM-LEP students ever active in the study.[2]

3B B. FAMILY BACKGROUND CHARACTERISTICS

Family structure, parents' educational levels, and socioeconomic status have all been shown to be related to academic achievement (Laosa, 1982b; Laosa, 1984; Brown, 1980; Carter & Segura, 1979; Duran, 1983; Henderson, 1981; Lambert, 1977; National Center for Education Statistics, 1978; Rosenthal, Baker, & Ginsberg, 1983). Therefore, a number of questions were asked about the parents or guardians of LM-LEP students as well as other family members.

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[1] Abbreviations and other special terms used in this study are defined in the glossary in Appendix A.

[2] Most parents were provided with two versions of the Parent Questionnaire, one in English and one in their native language. There were some imprecisions, however, in the Chinese translation of the Questionnaire. For a few items, therefore, results for Chinese language parents appeared to be unreliable, and are not presented in this chapter. Chinese language parents in selected sites are being resurveyed in Year 2, so the results for Chinese language parents may be slightly different in subsequent reports.

Respondents were asked to identify and describe the mother or main female guardian of the student, and also the father or main male guardian. In a number of cases, respondents reported the absence of male or female guardians in the household. Table 3.1 shows the pattern of parental or guardian presence for the three groups of LM-LEP students: Spanish native language students, Chinese native language students, and others. As can be seen, 21-22 percent of the LM-LEP students in the study came from homes missing either a male or female guardian. Spanish language students were more likely than others to live in a home without a male guardian.

TABLE 3.1. Presence of female and male parents or guardians in households of LM-LEP students

LM-LEP Group	N	Male and Female Guardians	Female Guardian Only	Male Guardian Only	Total
Grade 1					
Spanish	3727	76%	22%	2%	100%
Chinese	201	89	10	1	100
Other	515	84	14	2	100
Total	4443	78	21	1	100
Grade 3					
Spanish	2862	78%	21%	1%	100%
Chinese	207	84	15	1	100
Other	364	81	16	3	100
Total	3433	79	20	1	100

Respondents were also asked to indicate the level of education of the female and male guardians. As Table 3.2 indicates, fathers had completed more grades of schooling than had mothers, especially in the case of students with native languages other than Spanish.

TABLE 3.2. Mean years of education of mothers and fathers of LM-LEP students

	Mothers		Fathers	
LM-LEP Group	Mean*	N	Mean*	N
Grade 1				
Spanish	7.1	3484	7.4	2697
Chinese	6.6	194	8.0	173
Other	7.4	489	8.6	416
Total	7.1	4167	7.6	3286
Grade 3				
Spanish	6.6	2704	7.1	2125
Chinese	6.1	189	7.8	167
Other	7.0	337	8.2	284
Total	6.6	3230	7.3	2576

*If more than 13 years, a value of 14 years is included in the mean.

The education levels of parents were included as part of a broader composite of family socioeconomic status. The composite also contained a simple measure of occupational status (see Appendix B - Section 2), which was coded on a 1-5 scale designed for this study. The highest status occupation of the mother or father was combined with the mean educational level of parents to produce a scale ranging from 3 to 29. (The two components were combined with approximately equal weights). The number of households with socioeconomic status scores was limited, however, because some parents did not answer this item, and some families had no one working outside the home. (These families did not receive ratings.) The mean socioeconomic composite score for various LM-LEP subgroups is shown in Table 3.3. The results indicate that the Spanish language students came from the lowest status families, the Chinese language students were in the middle, and the other language group came from the highest status families.

TABLE 3.3. Socioeconomic composite scores for families of LM-LEP students

LM-LEP Group	Mean*	Standard Deviation	N
Grade 1			
Spanish	13.9	5.1	1954
Chinese	14.7	5.8	123
Other	17.0	6.0	282
Total	14.3	5.3	2359
Grade 3			
Spanish	13.5	5.0	1494
Chinese	14.4	5.5	100
Other	15.9	6.2	192
Total	13.8	5.2	1786

*The range of this composite was from 3 to 29. It was based on the mean educational level of the parents and the highest status occupation of the parents who worked outside the home. A more complete description of the composite is provided in Appendix B.

3C

C. HOME LANGUAGE USE

The extent of English versus native language usage in the classroom constitutes one of the major variables in the Longitudinal Study. The effectiveness of various instructional approaches, however, may depend upon the pattern of language usage in the homes of LM-LEP students (McLaughlin, 1981; Laosa, 1979; Laosa, 1982a). Parents who do not speak English in the home do not reinforce English skills learned in school, and may not be able to help with homework. A number of questions were therefore asked about home language usage.

Respondents were asked which languages were used by the mother or female guardian in the home, and by the father or male guardian. The responses were combined to create three categories of language use by parents: 1) one or more non-English languages, but not English; 2) English and at least one other language; and 3) English only. The breakdown of these categories for various LM-LEP subgroups is shown in Table 3.4. The Chinese language group was most likely to use only the native language in the home (86 percent, as opposed to 67 percent for Spanish language parents, and 56 percent for the other language group). In comparison to other groups, the other language group was most likely to use English. However, the majority of families in each group only used a non-English language in their home.

TABLE 3.4. Languages used in the home by parents of LM-LEP students

LM-LEP Group	N	Non-English Only	English and Non-English	English Only	Total
Grade 1					
Spanish	3668	67%	32%	1%	100%
Chinese	200	86	14	0	100
Other	504	56	39	5	100
Total	4372	66	32	2	100
Grade 3					
Spanish	2825	69%	30%	1%	100%
Chinese	199	88	12	0	100
Other	355	52	42	6	100
Total	3379	68	30	2	100

Respondents were also asked whether English and other language newspapers and magazines were received in the home. Although elementary students may not read newspapers or magazines, the presence of such material may provide additional evidence of parental behaviors and attitudes relating

TABLE 3.5. Percentage of LM-LEP students' homes receiving English and other language newspapers and magazines

	Percentage of homes receiving...							
	English language newspapers		English language magazines		Other language newspapers		Other language magazines	
LM-LEP Group	%	N[a]	%	N[a]	%	N[a]	%	N[a]
Grade 1								
Spanish	40%	3542	37%	3408	33%	3418	33%	3393
Other[b]	42	482	39	482	38	483	29	472
Grade 3								
Spanish	41%	2629	38%	2597	35%	2618	33%	2592
Other[b]	48	355	36	352	34	351	26	345

[a] N = number of cases for which this information was available.

[b] Other than Spanish or Chinese.

to language use. Table 3.5 shows that there were relatively small differences between the Spanish language and other language groups. This item was imprecisely translated on the Chinese parent questionnaire, and thus the results for the Chinese language group are omitted.

Television viewing by LM-LEP students of English and native language programs also provide evidence of home language exposure. Table 3.6 shows the mean number of hours per week which LM-LEP students were reported to have spent watching television programs in English and the native language. The other language group was less likely to watch programs in their native language; this difference may well be due to the lack of availability of such programs.

TABLE 3.6. Television viewing by LM-LEP students of programs in English and the native language

LM-LEP Group	English Mean hours per week	English N	Native language Mean hours per week	Native language N
Grade 1				
Spanish	9.1	3674	2.9	3679
Chinese	11.5	185	3.0	186
Other	11.2	491	1.1	490
Total	9.4	4350	2.7	4355
Grade 3				
Spanish	9.4	2787	3.0	2798
Chinese	9.5	177	3.8	179
Other	11.7	349	1.2	349
Total	9.7	3313	2.8	3326

3D

D. PARENTS' INTEREST IN EDUCATION

There is considerable evidence to suggest that parents' interest and involvement in education can affect the academic outcomes of their children (Gore, 1974; Kjolseth, 1972; Cervantes, 1978; Cervantes, Baca, & Torres, 1979). Therefore, a series of questions was asked relating to parent involvement.

The most direct question asked parents to indicate how frequently the LM-LEP student talked to grown-ups in the family about what happens in school. The responses are shown in Table 3.7. Spanish language parents reported a higher frequency of conversations, while Chinese language parents reported a relatively lower frequency. Overall, 80 percent of parents reported discussing school with LM-LEP students "almost every day."

The academic orientation of a family can also be inferred from typical activities in a household. Parents with high educational expectations may require that children spend more time on homework, may read more to their children, or may encourage more reading. Table 3.8 shows the mean number of hours per week which parents reported that their LM-LEP children spent doing homework, reading (other than homework), and being read to. Spanish language students were reported to spend fewer hours on homework and other reading than were other LM-LEP students.

TABLE 3.7. Frequency of discussions about school between LM-LEP students and their parents

		Frequency of discussion			
LM-LEP Group	N	Less than once a week	One to three times a week	Almost every day	Total
Grade 1					
Spanish	3758	3%	11%	86%	100%
Chinese	196	17	26	57	100
Other	513	9	17	74	100
Total	4467	4	12	84	100
Grade 2					
Spanish	2865	5%	13%	82%	100%
Chinese	193	24	34	42	100
Other	368	9	21	70	100
Total	3426	6	15	79	100

TABLE 3.8. Mean hours per week spent by LM-LEP students doing homework, reading (other than homework), and being read to

LM-LEP Group	Doing homework Mean hours	Doing homework N	Reading Mean hours	Reading N	Being read to Mean hours	Being read to N
Grade 1						
Spanish	4.5	3686	1.5	3683	1.8	3679
Chinese	6.6	186	3.1	185	1.7	186
Other	5.6	490	2.8	491	2.5	488
Total	4.7	4362	1.7	4359	1.9	4353
Grade 3						
Spanish	5.1	2799	1.8	2808	1.6	2804
Chinese	7.0	180	3.4	180	1.4	177
Other	6.4	349	3.7	350	2.0	343
Total	5.4	3328	2.1	3338	1.6	3324

Finally, the academic orientation of a family may be reflected in the expectations which parents have for the amount of schooling which the child will probably complete. The parents' educational expectations for LM-LEP students are shown in Table 3.9. The pattern on this variable was complex. In general, the parents of approximately 50 percent of LM-LEP students expected their children to go on to college. Parents of Spanish language students generally had the lowest expectations. Parents of Chinese language students had a mixture of both very high and very low expectations, while parents of other language students had medium to high expectations.

TABLE 3.9. Parents' educational expectations for LM-LEP students

LM-LEP Group	N	9th grade or less	High school graduate	Post-high-school vocational school	College	Total
Grade 1						
Spanish	3308	6%	33%	11%	50%	100%
Chinese	181	16	4	5	75	100
Other	473	4	24	8	64	100
Total	3962	6	31	10	53	100
Grade 3						
Spanish	2578	6%	34%	13%	47%	100%
Chinese	176	26	3	8	63	100
Other	350	9	21	8	62	100
Total	3104	8	31	12	49	100

3E E. RELATIONSHIPS AMONG HOME AND PARENT CHARACTERISTICS

In order to examine the relationships among home and parent characteristics, a matrix of correlations was computed for seven variables:

1. Family Socioeconomic Status--a composite of education level and occupational status of the parents;
2. Family Size--the total number of persons living in the household of the student;
3. Home English Use--languages used in the home by parents: 1 = no English, 2 = English and other, 3 = English only;
4. Discussions About School--frequency of discussions between child and parents: 1 = less than once a week, 2 = one to three times a week, 3 = almost every day;

5. Homework Hours--number of hours per week student was reported spending on homework;

6. Reading Hours--number of hours per week student spent reading (other than homework) or being read to; and

7. Educational Expectations--the highest grade or level the parent expected the child to reach: 1 = ninth grade or less, 2 = high school graduate, 3 = post-high school vocational school, 4 = college.

Table 3.10 shows the correlations among these variables for first graders, while Table 3.11 shows the same correlations for third graders. Family socioeconomic status correlated moderately with home English use and educational expectations; also, homework hours and reading hours were moderately correlated. Otherwise, there were few meaningful relationships. The relationship between family socioeconomic status and home English use is further illustrated in Table 3.12. In general, families who used English in the home had a higher socioeconomic status than those who did not.

TABLE 3.10. Correlations among selected home and parent characteristics for first grade LM-LEP students*

	Variable						
	1	2	3	4	5	6	7
1. Family SES	--	-.149 (1463)	.364 (2351)	.048 (2312)	.099 (2297)	.105 (2299)	.272 (2112)
2. Family Size	-.149 (1463)	--	-.050 (2385)	-.033 (2446)	-.034 (2419)	.020 (2419)	-.104 (2239)
3. Home English Use	.364 (2351)	-.050 (2385)	--	.043 (4233)	.040 (4147)	.132 (4154)	-.015 (3770)
4. Discussion About School	.048 (2312)	-.033 (2446)	.043 (4233)	--	.054 (4264)	.068 (4272)	.062 (3902)
5. Homework Hours	.099 (2297)	-.034 (2419)	.040 (4147)	.054 (4264)	--	.393 (4351)	.074 (3816)
6. Reading Hours	.105 (2299)	.020 (2419)	.132 (4154)	.068 (4272)	.393 (4351)	--	.091 (3823)
7. Education Expectations	.272 (2112)	-.104 (2239)	-.015 (3770)	.062 (3902)	.074 (3816)	.091 (3823)	--

*Correlations were calculated pairwise. The number of cases is presented in parentheses.

TABLE 3.11. Correlations among selected home and parent characteristics for third grade LM-LEP students*

	Variable						
	1	2	3	4	5	6	7
1. Family SES	--	-.186 (1198)	.339 (1778)	.076 (1753)	.165 (1729)	.143 (1741)	.252 (1614)
2. Family Size	-.186 (1198)	--	-.079 (2029)	-.042 (2064)	-.021 (2052)	-.031 (2059)	-.043 (1915)
3. Home English Use	.339 (1778)	-.079 (2029)	--	.062 (2258)	.082 (3169)	.156 (3185)	-.026 (2952)
4. Discussions About School	.076 (1753)	-.042 (2064)	.062 (3258)	--	.074 (3237)	.062 (3252)	.099 (3049)
5. Homework Hours	.165 (1729)	-.021 (2052)	.082 (3169)	.074 (3237)	--	.400 (3327)	.116 (2962)
6. Reading Hours	.143 (1741)	-.031 (2059)	.156 (3185)	.062 (3252)	.400 (3327)	--	.108 (2975)
7. Education Expectations	.252 (1614)	-.043 (1915)	-.026 (2952)	.099 (3049)	.116 (2962)	.108 (2975)	--

*Correlations were calculated pairwise. The number of cases is presented in parentheses.

TABLE 3.12. Mean socioeconomic status ratings for families of LM-LEP students with different patterns of home language use

Language Use in the Home	Mean Socioeconomic Status Rating	Standard Deviation	Number of Cases
Grade 1 - Cohort A			
Native language only	12.9	5.0	1442
Native language and English	16.4	5.0	879
English only	20.4	4.2	30
Grade 3 - Cohort B			
Native language only	12.5	4.9	1137
Native language and English	15.9	5.0	603
English only	17.9	4.4	38

3F

F. SUMMARY

In this chapter, data were presented concerning the parents and households of LM-LEP students in the Longitudinal Study. Parent and home characteristics will be available for use as control and predictor variables in Year 2 and Year 3 academic outcome analyses, so this chapter serves to describe some specific components of our analytic model.

In particular, the results indicate that there are meaningful language group differences on such factors as parental presence, socioeconomic status, language use in the home, parent-child conversations about school, time spent on homework and reading, and parental expectations concerning the child's eventual educational achievement. These differences emphasize the importance of not assuming similarities among LM-LEP students from different language groups, and the potential importance of parent and home variables as predictors of academic outcomes.

The data suggest that the Spanish language students in the Longitudinal Study are more likely than other LM-LEP students to come from homes missing a male guardian and to come from families of lower socioeconomic status. Spanish language students were also reported to spend less time on homework and other reading, and their parents had lower expectations about their eventual academic achievement. All of these findings would appear to suggest that Spanish language students might have lower academic achievement than other LM-LEP groups.

On most variables, Chinese language students in the study come from homes whose characteristics would be thought to lead to greater academic achievement. However, parents of Chinese language students reported using less English in the home than other LM-LEP groups, and also reported less conversations about school. The pattern of results is thus quite complex, so that in outcome analyses it will be important to consider these variables while examining differences in outcomes related to different instructional services.

CHAPTER 4

STUDENT CHARACTERISTICS

Chapter 4. STUDENT CHARACTERISTICS[1]

4A A. INTRODUCTION

The purpose of this chapter is to describe the students in the study in terms of certain variables which are expected to relate to their acquisition of English and to their ability to function successfully academically. Factors such as age, length of time in the U.S., oral language proficiency in English and in the native language, and academic aptitude are presented and discussed, focusing primarily on the LM-LEP students in the sample.

4B B. DEMOGRAPHIC CHARACTERISTICS

The time in the U.S. and age of LM-LEP students are demographic characteristics that are of interest in the context of this study's goals. LM-LEP students who differ in age and in length of time in the U.S. will differ in their opportunities for exposure to English, one factor that can affect English language acquisition. Students who have very recently arrived in the U.S. will generally be proficient in their native language but may not have had much exposure to English.

Students who have been in the U.S. for a number of years are more likely to have had at least some exposure to English and to the American culture; this familiarity with the language and the culture will generally provide some advantage to the student in learning English and in achieving academically. However, their level of ability in their native language will probably be more variable than that of recent immigrants, of the same age (Cummins, 1980; Genesee, 1978; Skutnabb-Kangas, 1979), and will depend on the extent to which their experience in their home community and in other situations involves use of the native language.

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[1] Abbreviations and other special terms used in this study are defined in the glossary in Appendix A.

The mean number of years that students have been in the U.S. is presented in Table 4.1 for students in the Spanish, Chinese, and other language groups within each cohort. The similarity between first and third grade students in this regard may be attributed to the difference in the nature of the two samples. The grade 3 sample includes slightly more students who have recently arrived in the U.S. and somewhat fewer students who have been in the U.S. more than five years than does the grade 1 sample. Frequently, students who are classified as LM-LEP in the first grade have been reclassified by the time they are in grade 3 and, therefore, would not have been included in the grade 3 sample.

The data in Table 4.1 also show that the Spanish language students in the study had on the average been in the U.S. longer than have the other students in the study. The Chinese language students, particularly at grade 3, were more likely than students in either of the two other language groups to have been in the U.S. for three years or less. As will be discussed later, these data can be related to data on native language proficiency in which the Chinese students were found to have generally higher levels of native language proficiency.

Age may also be related to exposure to English; older children, even if in the U.S. for only a few years, are more likely to have come into contact with English in school. Age is also a consideration with regard to placement in programs. In some school districts, when LM-LEP students are placed in instructional programs, their level of ability in English rather than their age determines the grade level at which they are placed. For example, children may be placed in a program with students who are one or two years younger so that they are better able to handle the requirements of the classroom. Comparisons between English-proficient and LM-LEP students or between language groups would be more complex if this were generally the

TABLE 4.1. LM-LEP students' number of years in mainland U.S. by language group

	Percentage of Students						
Grade 1	0-1 Years	2-3 Years	4-5 Years	More than 5 Years	Total	N	Mean Years
Spanish	7.6%	10.7%	12.8%	69.0%	100%	3747	5.39
Chinese	17.1	19.2	23.8	39.9	100%	193	4.20
Other	11.2	19.3	21.9	47.6	100%	498	4.67
LM-LEP Overall	8.4%	12.0%	14.3%	65.3%	100%	4438	5.25
Grade 3							
Spanish	8.7%	11.4%	13.2%	66.8%	100%	2877	6.49
Chinese	22.5	24.0	23.5	30.0	100%	200	4.24
Other	10.9	22.4	29.4	37.3	100%	357	4.99
LM-LEP Overall	9.7%	13.2%	15.5%	61.6%	100%	3434	6.20

TABLE 4.2. Mean age* of students

Sample Group	Grade 1		Grade 3	
	Mean Age	N	Mean Age	N
LM-LEP students	6.79	5480	9.00	4192
EP/LIS	6.68	945	8.73	890
EP/Comp	6.76	548	8.85	548

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*Age (in years) as of January 1985. The ages of students were calculated to the nearest month.

case, since age corresponds to differences in cognitive developmental level that would affect learning. As shown in Table 4.2, the mean ages for LM-LEP students, EP-LIS, and EP/Comp students are quite similar, suggesting that LM-LEP students tend to be placed in age-appropriate grade levels.

4C C. ORAL LANGUAGE PROFICIENCY

Developing oral proficiency in English is an important part of becoming a fully participating student in the classroom; also, oral proficiency can serve as an important first step toward the development of ability in reading and writing English (Ching, 1976; Goodman, Goodman, & Flores, 1979; Gunther, 1980; Mace-Matluck, 1982, 1985; Thonis, 1976). It is therefore important to have an estimate of students' level of oral proficiency in English at entry into the instructional services.

Also important is information on the students' level of oral proficiency in their native language, particularly for students who are placed in instructional services in which at least some portion of instruction is provided in the native language.

The measure of oral proficiency used in this study was the Student Oral Proficiency Rating (SOPR) form. LM-LEP students were rated by teachers who were proficient in the language being rated and who were also familiar with the student's performance in the language in a range of classroom situations.

Students were rated on a scale of 1 to 5 in five categories of oral proficiency: comprehension, vocabulary, fluency, pronunciation, and grammar. A rating of 1 indicated minimal or no proficiency in that category, while a rating of 5 indicated ability equivalent to that of a monolingual speaker of the same age as the student being rated.

The SOPR is a slightly modified version of the SOLOM (Student Oral Language Observation Matrix), an instrument used by the State of California for measuring students' oral proficiency. Prior to its use in this study, research on the reliability and validity of the SOPR (Zehler, 1985) revealed that ratings of two independent raters were substantially in agreement in indicating the oral proficiency level of individual students. Also, scores on the SOPR/SOLOM were shown to be highly correlated with scores on the BSM (Bilingual Syntax Measure) and on the LAS (Language Assessment Scales, I and II).

In the fall of 1984, all LM-LEP students in the study were rated on English and, where possible, on native language oral proficiency, by a teacher proficient in the language to be rated who had experience in instructing the student using that language. On the whole, the intercorrelations of the ratings on the five categories of oral proficiency (comprehension, vocabulary, fluency, pronunciation, and grammar) were high (ranging from .76 to .96). For each student, these five separate scores were summed to obtain a total score ranging from 5 to 25, with 5 indicating minimal or no proficiency at all in the language and 25 indicating a native speaker's level of oral proficiency (again, "native speaker" refers to one who is of the same age as the student being rated).

Table 4.3 shows the intercorrelations among the five English SOPR rating scales and their total, and the corresponding values for the native language SOPR. Also included in this table, for reasons explained in the next paragraph, are correlations with the "Speaking" score, which is the sum of four of the five scales (all scales except the first, Comprehension).

Further data bearing on the relative usefulness of the five SOPR individual scales and the total are provided in Chapter 8, in Tables 8.7a[1] and 8.7b, which show the cross-correlations between SOPR ratings and scores on the Stanford Achievement Test. Because intercorrelations among the individual SOPR ratings were so high (see Table 4.3) the correlations of the various SOPR ratings, and even total SOPR, with SAT tests were quite uniform. For instance, for the SAT vocabulary test, the only SAT test with a direct correspondence to a SOPR rating, the correlation pattern did not show any particular match between the SOPR Vocabulary rating and the SAT Vocabulary test even though both were intended to apply to oral vocabulary. It would appear from this and other evidence (to be discussed later) that most raters did not perceive a difference in the students' performance in the five aspects of oral proficiency. But they did appear to make a distinction, at least on the English SOPR, between four of the five aspects and a fifth, specifically between students' ability to speak and ability to comprehend speech by others. The intercorrelations among the four scales in the Speaking composite were systematically higher than the correlations of Comprehension with each of the four. This was true in both cohorts, and the differences are unquestionably statistically significant.[2] Therefore,

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[1] Extracted from Tables E.4a and E.4b (in Appendix E).

[2] By conservative estimate, the difference is significant at the .0001 level for Cohort A and at the .00001 level for Cohort B. Significance was tested via Fisher's r-to-z transformation; the estimate is conservative because the standard error of the difference in z values was computed ignoring (1) the fact that the z values were from the same sample and therefore probably correlated, and (2) the fact that the two z values compared were themselves averages. Each of these considerations, if not ignored, would have the effect of reducing the standard error of the difference between z values and thus would show the difference to be even more significant.

TABLE 4.3. Intercorrelations among SOPR scales separately by cohort and SOPR

Based on LM-LEP Students

SOPR	Cohort	Grade	N	SOPR Scale	Comp.	Speak	Flu.	Vocab	Pron.	Gram.	Mean	σ
English SOPR[a]	A	1	1550	Total	.927	.996	.951	.961	.936	.954	16.51	5.70
				Comprehension		.888	.874	.860	.814	.841	3.49	1.17
				Speaking			.949	.964	.945	.961	13.02	4.63
				Fluency				.909	.843	.872	3.16	1.22
				Vocabulary					.873	.901	3.24	1.22
				Pronunciation						.896	3.39	1.20
				Grammar							3.23	1.21
	B	3	1434	Total	.897	.983	.940	.938	.919	.934	17.97	4.51
				Comprehension		.839	.812	.791	.761	.787	3.81	.98
				Speaking			.942	.945	.930	.941	14.16	3.66
				Fluency				.866	.829	.842	3.48	.99
				Vocabulary					.827	.859	3.53	.98
				Pronunciation						.838	3.66	.98
				Grammar							3.50	.95
Native language SOPR[b]	A	1	1827	Total	.930	.996	.958	.958	.900	.938	20.11	5.66
				Comprehension		.893	.881	.867	.791	.829	4.12	1.12
				Speaking			.957	.960	.908	.944	15.98	4.63
				Fluency				.923	.815	.868	3.95	1.25
				Vocabulary					.812	.885	3.97	1.22
				Pronunciation						.804	4.15	1.19
				Grammar							3.92	1.25
	B	3	1514	Total	.914	.995	.951	.957	.948	.917	21.08	4.99
				Comprehension		.870	.853	.835	.834	.778	4.32	1.00
				Speaking			.950	.962	.952	.928	16.76	4.10
				Fluency				.900	.876	.828	4.20	1.07
				Vocabulary					.897	.850	4.18	1.07
				Pronunciation						.835	4.29	1.08
				Grammar							4.08	1.10

[a] Data extracted from Tables E.4a and E.4b (in Appendix E).
[b] Data extracted from same pairwise matrix as Table 8.7b.

although most use of the SOPR will probably be confined primarily to the overall SOPR total, it will be supplemented, where appropriate, by the Speaking composite and the Comprehension rating.

4C.1 ORAL PROFICIENCY IN ENGLISH AND IN THE NATIVE LANGUAGE

In Table 4.4, the mean English and native language SOPR scores are presented separately for first and third grade students in the Spanish, Chinese, and other language groups. The means show a higher level of English oral proficiency for the grade 3 students than for the grade 1 students. A similar, although smaller, difference in means was found for native language oral proficiency. The grade 3 means were higher within each of the separate language groups, except for the Chinese language students' oral proficiency in Chinese.

In Tables 4.5, 4.6a, and 4.6b, the SOPR data are presented with the SOPR scores broken into score range categories that represent five oral proficiency levels: 5-9, no proficiency or very limited proficiency in the language (a level at which even simple conversational ability is very poor); 10-14, limited oral proficiency (a level at which there is some conversational ability, given an understanding and patient listener); 15-19, functional oral proficiency (a level at which conversations can be carried out fairly comfortably, although with some errors, lapses in vocabulary, and need for repetition); 20-24, fluent in the language (a level at which the speaker is generally fluent in the language, but may still produce grammatical errors, lack some common vocabulary, or require some repetition); and 25, native-speaker proficiency (a level at which the speaker cannot be distinguished from a person who is a monolingual native speaker of the language).

Overall, 74 percent of first-grade LM-LEP students and 60 percent of third-grade LM-LEP students in the study were rated as having scores of 19 or lower, that is, as having functional oral proficiency, limited oral proficiency, or very limited oral proficiency in English. For the native language, a contrasting pattern was found in which 29 percent of first graders and 22 percent of third graders were rated as functional, limited, or very limited in oral proficiency, and the remaining 71 and 78 percent of students were rated as fluent or as having a native-speaker level of oral proficiency in their native language.

TABLE 4.4. Mean English and native language SOPR total scores for LM-LEP students

	English SOPR			Native Language SOPR		
	Mean SOPR Total Score	SD	No. of Cases	Mean SOPR Total Score	SD	No. of Cases
Grade 1						
Spanish	14.1	5.94	3944	20.7	5.29	3754
Chinese	14.7	6.04	182	22.3	3.54	120
Other	16.5	5.60	486	19.3	6.14	308
Total	14.4	5.95	4612	20.7	5.08	7311
Grade 3						
Spanish	16.6	5.38	3007	21.5	4.58	2805
Chinese	15.8	5.49	173	21.9	2.76	86
Other	18.2	4.32	388	20.4	6.12	238
Total	16.7	5.31	3568	21.4	4.68	3129

TABLE 4.5. Distribution of English and native language SOPR total scores of LM-LEP Students

English SOPR

SOPR Total Score	Oral Proficiency Level	Grade 1 Percentage of Students	Grade 3 Percentage of Students
5-9	Very limited or no oral proficiency	21.7%	10.5%
10-14	Limited oral proficiency	25.7	16.4
15-19	Functional oral proficiency	26.5	33.4
20-24	Fluent oral proficiency	20.8	34.0
25	Native-speaker oral proficiency	5.3	5.7
Total		100.0%	100.0%
No. of Cases		4612	3568

Native Language SOPR

SOPR Total Score	Oral Proficiency Level	Grade 1 Percentage of Students	Grade 3 Percentage of Students
5-9	Very limited or no oral proficiency	4.7%	3.0%
10-14	Limited oral proficiency	9.2	6.1
15-19	Functional oral proficiency	15.3	13.1
20-24	Fluent oral proficiency	31.0	39.0
25	Native-speaker oral proficiency	39.8	38.8
Total		100.0%	100.0%
No. of Cases		4182	3129

Table 4.5 shows that 26 percent of the grade 1 students and about 40 percent of the grade 3 students were rated at either the native-speaker level of oral language proficiency in English or the fluent level.

Differences were found in the data for grade 1 students versus grade 3 students. Grade 1 students were predominantly in the lower levels of oral proficiency: 47 percent of the grade 1 students were rated as limited in English or lower, with 22 percent rated at the lowest level. Grade 3 students showed a generally higher level of English oral proficiency. The proportion of students in the two lowest oral proficiency levels (27 percent) was much lower than the grade 1 proportion, and proportionally more grade 3 students were rated as functional or as fluent in English oral proficiency.

The majority of LM-LEP students in both grade 1 and grade 3 were rated as fluent or as native speakers in level of oral proficiency in their native language; 40 percent of first graders and 39 percent of third graders were rated as 25, native-speaker level. LM-LEP students were rated as limited or very limited in native language oral proficiency in 12 percent of the cases.

Tables 4.6a and 4.6b present the SOPR data for English and for the native language respectively, broken out by Spanish, Chinese, and other language groups. The data in Table 4.6a show that Spanish language students were somewhat less proficient overall in English oral ability: Spanish language students were more likely to be rated as very limited or as limited in oral proficiency compared to the students in the Chinese and other language groups. Considering the proportions of students rated as fluent or as at the native-speaker level, the Spanish and the Chinese language students were less likely to be rated in these levels for English oral proficiency in comparison to the students in the other language group.

The data for native language oral proficiency are presented by language group in Table 4.6b. Most notable, perhaps, is the fact that a very small proportion of the Chinese language students were rated in the two lowest levels of oral proficiency. This might be because the Chinese language

TABLE 4.6a. English SOPR total scores: Percentage of LM-LEP students in five oral proficiency levels by language group

SOPR Total Score	SPANISH Grade 1 Percentage of Students	SPANISH Grade 3 Percentage of Students	CHINESE Grade 1 Percentage of Students	CHINESE Grade 3 Percentage of Students	OTHER Grade 1 Percentage of Students	OTHER Grade 3 Percentage of Students
5-9	22.9%	11.1%	20.9%	16.2%	12.1%	3.6%
10-14	26.5	16.7	18.1	16.8	22.0	13.9
15-19	26.1	34.1	35.7	26.0	26.5	31.7
20-24	19.7	32.2	18.1	39.9	31.5	45.6
25	4.9	6.0	7.1	1.2	7.8	5.2
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
No.of cases	3944	3007	182	173	486	388

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*The five proficiency levels represented by the total score ranges can be generally described as follows: 5-9, Very limited or no oral proficiency; 10-14, Limited oral proficiency; 15-19, Functional proficiency; 20-24, Fluent oral proficiency; 25, Native speaker oral proficiency.

TABLE 4.6b. Native language SOPR total scores: Percentage of LM-LEP students in five oral proficiency levels by language group

SOPR Total Score	SPANISH		CHINESE		OTHER	
	Grade 1	Grade 3	Grade 1	Grade 3	Grade 1	Grade 3
	Percentage of Students	Percentage of Students	Percentage of Students	Percentage of Students	Percentage of Students	Percentage of Students
5-9	4.5%	2.7%	--	--	9.1%	8.0%
10-14	9.1	5.9	4.2	--	12.3	10.1
15-19	15.4	13.4	9.2	16.3	15.6	8.8
20-24	30.6	38.6	39.2	58.1	33.1	35.7
25	40.3	39.3	47.5	25.6	29.9	37.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
No.of cases	3754	2805	120	86	308	238

*The five proficiency levels represented by the total score ranges can be generally described as follows: 5-9, Very limited or no proficiency; 10-14, Limited oral proficiency; 15-19, Functional oral proficiency; 20-24, Fluent oral proficiency; 25, Native speaker oral proficiency.

students in the study had generally been in the U.S. for a shorter period of time than had the Spanish and other language students (see Table 4.1). The major proportion of students in each of the language groups was rated as fluent or at a native-speaker level in oral proficiency.

4C.2 EXTENT OF BILINGUAL ORAL PROFICIENCY

In describing the language background of LM-LEP students, it is important to consider simultaneously the students' level of proficiency in English and their native language. It is important, first, because there may be some transfer effects of proficiency in the native language to development of proficiency in English. That is, LM-LEP students may vary in their success in academic achievement, particularly in English language arts, depending on their level of proficiency in their native language.

Also, research has indicated that there are students who are not proficient in any language, (i.e. they are proficient neither in English nor their native language). This can happen, for example, when children who have not yet fully acquired their native language move to a new environment where another language is spoken. These children may stop using their native language and start using the new language exclusively. The result for some period of time will be a child who is very low in proficiency in both languages. Students who are not very proficient in either of their languages may be particularly "at risk" in terms of academic success. Therefore, it will be of special importance to attempt to determine which types of programs are most effective for these students.

In order to examine students' oral proficiency in English and in their native language in terms of a bilingual oral proficiency, bivariate distributions were obtained; these distributions, shown in Tables 4.7, 4.8, 4.9, 4.10, 4.12a, and 4.12b, were based on LM-LEP students for whom a SOPR score was available in both languages.[1] In these six tables, the SOPR

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[1] Where no person was available who was able to rate the student in the native language, no native language SOPR was obtained. Also, for a variety of reasons, for some students the native language SOPR score was the only one obtained.

TABLE 4.7. Percentage of LM-LEP students in combined English and native language SOPR categories

SOPR Total Scores Native Language	 English	Grade 1 Percentage of Students	Grade 3 Percentage of Students
5-11	5-11	3.7%	1.5%
	12-18	1.4	1.8
	19-25	4.0	2.8
12-18	5-11	6.7	3.0
	12-18	6.9	5.3
	19-25	3.4	5.1
19-25	5-11	27.6	14.8
	12-18	24.4	30.7
	19-25	21.8	35.1
Total		100.0%	100.0%
No. of Cases		4,110	3,081

TABLE 4.8. Spanish language LM-LEP students: Percentage of students in combined English and native language SOPR categories

SOPR Total Scores		Grade 1	Grade 3
Native Language	English	Percentage of Students	Percentage of Students
5-11	5-11	3.8%	1.6%
	12-18	1.3	1.6
	19-25	3.7	2.3
12-18	5-11	6.8%	3.1%
	12-18	7.2	5.5
	19-25	3.2	5.1
19-25	5-11	28.4%	14.8%
	12-18	24.6	30.8
	19-25	21.2	35.1
Total		100.0%	100.0%
No. of Cases		3,692	2,763

TABLE 4.9. Chinese language LM-LEP students: Percentage of students in combined English and native language SOPR categories*

SOPR Total Scores Native Language	 English	Grade 1 Percentage of Students	Grade 3 Percentage of Students
5-11	5-11	2.6%	0.0%
	12-18	0.0	0.0
	19-25	0.0	0.0
12-18	5-11	6.9%	4.7%
	12-18	1.7	0.0
	19-25	0.9	5.8
19-25	5-11	33.6%	32.6%
	12-18	40.5	34.9
	19-25	13.8	22.1
Total		100.0%	100.0%
No. of Cases		116	86

TABLE 4.10. Other language group LM-LEP students: Percentage of students in combined English and native language SOPR categories*

SOPR Total Scores		Grade 1	Grade 3
Native Language	English	Percentage of Students	Percentage of Students
5-11	5-11	4.0%	0.4%
	12-18	3.6	5.2
	19-25	10.3	9.9
12-18	5-11	4.6%	0.0%
	12-18	6.0	4.7
	19-25	7.0	4.7
19-25	5-11	16.6%	7.8%
	12-18	15.9	28.4
	19-25	32.1	38.8
Total		100.0%	100.0%
No. of Cases		302	232

total scores in each language are categorized into one of three oral proficiency levels: total score of 5-11 (no proficiency or very limited oral proficiency); total score of 12-18 (limited proficiency); and total score of 19-25 (moderate to full oral proficiency in the language). Implicit in the labels ("no proficiency," "limited proficiency," etc.) that we have attached to the English and native language SOPR totals is the assumption that the ratings for the two languages are equivalent, and not based on different standards. Given the general nature of the rating system used in the SOPR, and the fact that for many students the same person completed both the English and native language SOPR, this assumption seems reasonable.

Overall, as seen in Table 4.7, the largest proportion of the students (about three-quarters for Cohort A and four-fifths for Cohort B) were those who were rated as generally proficient in their native language. These students who were rated as proficient in their native language were almost equally split in grade 1 by level of rated oral proficiency in English. The pattern of proficiency for students rated 19-25 in native language oral proficiency differed to some extent from grade 1 to grade 3. Generally, at grade 3 there were proportionally fewer students rated in the lowest score range (5-11) for English and proportionally more students rated in the high score range (19-25) on English oral proficiency compared to what was found for grade 1. To a lesser degree, this same pattern of higher English ratings at grade 3 is seen for students rated 12-18, limited oral proficiency, in the native language.

Students who do not appear to have achieved proficiency appropriate for their age in either English or their native language may be considered to be "at risk," and it will be particularly important to follow them. The most severe cases of students without oral proficiency in either language are those who were rated as having very limited oral proficiency in both languages. A small proportion of the students in the sample were rated as such; by grade, these students comprise about 4 percent of the LM-LEP students in grade 1, and 2 percent of the students in grade 3.

It is also possible to consider as "at risk" those students who do not achieve any higher than a "limited" (12-18) rating in either of the languages they use. Since a "limited" rating indicates that the student is quite below the level of oral proficiency expected of a native-speaking child, these students may also be hindered academically due to a lack of the cognitive and linguistic skills that are gained through proficient use of a language. Thirteen percent of the students overall had at least, but no higher than, a "limited" rating in one or both of their languages. At grade 1, this represented 15 percent of the students; at grade 3, the proportion of students was 10 percent. Overall, students who can be classified as at risk in terms of bilingual ability comprised 19 percent of the grade 1 LM-LEP students and 12 percent of the grade 3 LM-LEP students, representing 16 percent of LM-LEP students in both grades.

The data were not consistent across the three language groups. For example, there were fewer Chinese language students rated in categories designated as "at risk". This follows from the earlier finding that few of the Chinese students were rated as having little or limited ability in their native language. Also, compared to the Spanish language and the other language students, proportionally fewer Chinese language students were rated 19-25 both in their native language and in English. This pattern may indicate that the Chinese language students who had achieved higher levels of proficiency in English were being exited out of special services at an earlier point than was the case for other students. Data to determine whether this explanation is valid will be obtained as these students are followed in the second and third years of the study.

4C.3 ORAL LANGUAGE PROFICIENCY AND LENGTH OF TIME IN THE U.S.

Length of time in the U.S. is expected to be related to oral language proficiency in both languages. It is expected that students will show higher levels of English language ability the longer they have resided in the U.S. as a consequence of having had more exposure and presumably more experience in use of English. Similarly, native language oral proficiency may decrease with longer time in the U.S., as a consequence of a shift to English that is accompanied by correspondingly less use of the native language.

Table 4.11 shows the students' SOPR oral proficiency ratings in English and in the native language in relation to length of stay in the U.S. As expected, for both grade 1 and grade 3 students, the mean SOPR total score for English oral proficiency was higher for students who had been in the U.S. for longer periods of time.

The means for grade 1 and grade 3 students were essentially the same for those in the U.S. no more than one year. For both grades, the mean total score was approximately 9, representing a quite limited level of oral proficiency. For all other categories of length of stay in the U.S., the grade 3 students' mean was higher than the grade 1 students' mean. The highest mean English total SOPR score in each grade, 15 for grade 1, 18 for grade 3, was for those students with more than five years of residence in the U.S. These mean scores represent a limited level of oral English proficiency.

Oral proficiency in the native language for both grades remained constant for students with up to five years in the U.S. For these students the grade 3 mean of about 22 was only slightly higher than the grade 1 mean of about 21; these scores represent a fairly high level of oral proficiency. Only for those students who had been in the U.S. for more than five years was there a decrease in native language, and even then, the drop in ratings was small.

TABLE 4.11. SOPR oral proficiency score means by length of time in the U.S.

	English SOPR		Native Language SOPR	
	Mean	No. of Cases	Mean	No. of Cases
Grade 1				
Yrs. in the U.S.:				
0-1:	9.9	309	21.4	276
2-3:	12.9	474	21.6	392
4-5:	13.8	579	21.7	518
6 or more:	15.4	2579	20.5	2392
Grade 3				
Yrs. in the U.S.:				
0-1:	9.6	289	22.6	245
2-3:	15.1	409	22.5	342
4-5:	17.1	479	22.3	408
6 or more:	18.2	1917	20.9	1730

Length of time in the U.S. was also examined in relation to the combined SOPR categorizations. These data are shown in Table 4.12a and 4.12b. Of particular interest, perhaps, are the "at risk" students identified by this categorization. For both grades, very low ratings of oral proficiency in both languages occurred proportionally more often for students who had been in the U.S. for one year or less, and to some extent, for students who had been in the U.S. for more than five years. Very low ratings in both languages occurred proportionally less often for students who had been in the U.S. between two and five years. This pattern of data may indicate two different possibilities in English acquisition for students. First, students who have recently entered the U.S. may, on noticing the new language environment around them, stop using their native language and begin to attempt to use only English. Particularly within the first year of doing so, these students are likely to be rated as very poor in both their native language and English. Presumably, after a period of time, these students would continue to learn English and become fairly proficient in it.

Second, this same type of situation may occur for students residing in the U.S. for longer periods of time, e.g., for more than five years. In these cases, proficiency in English may never develop because the student, for reasons of inadequate exposure to English, reaches a language learning plateau at a low level of English and stays there. (For example, a child's parents may decide to encourage their child's English use by using English themselves at home. If their English is quite poor, the child will be exposed to inadequate and incorrect English). Another, more likely explanation for the slightly higher percentage of "at risk" students among the group that have been in the U.S. more than five years is related to mixed language use. Many of the students who have been in the U.S. for a long period of time may be within environments where language use typically involves a mixture of English and the native language. While not necessarily so, someone who speaks a mixed dialect may not have control of the two languages independently. Such a person in speaking to someone who knew only the native language, or only English, would not be able to use only that one language proficiently. These students thus have a language--their mixed dialect--but they will be hindered academically in that they will not be sufficiently able to participate in instruction conducted in just one language.

TABLE 4.12a. Combined English and native language SOPR categories by length of time in the United States: Grade 1

SOPR Total Scores		Grade 1					
Native Language	English	0-1 Yr.	2-3	4-5	More than 5-Years	Total	No. of Cases
5-11	5-11	10.6%	10.6%	7.1%	71.7%	100%	113
	12-18	2.2	13.0	6.5	78.3	100	46
	19-25	0.7	1.5	3.0	94.8	100	135
12-18	5-11	11.9%	15.0%	17.3%	55.8%	100%	226
	12-18	6.6	8.6	13.9	70.9	100	244
	19-25	--	4.6	7.3	88.1	100	109
19-25	5-11	15.5%	14.2%	15.2%	55.2%	100%	1003
	12-18	4.6	11.4	17.8	66.2	100	870
	19-25	2.5	8.7	13.4	75.4	100	786
	Overall:	7.7%	11.0%	14.4%	66.9%	100%	
	No. of Cases	272	389	508	2363		3532

TABLE 4.12b. Combined English and native language SOPR categories* by length of time in the United States: Grade 3

SOPR Total Scores		Grade 3					
Native Language	English	0-1 Yr.	2-3	4-5	More than 5-Years	Total	No. of Cases
5-11	5-11	15.2%	9.1%	9.1%	66.7%	100%	33
	12-18	--	5.9	13.7	80.4	100	51
	19-25	--	2.5	1.3	96.2	100	79
12-18	5-11	30.8%	21.8%	10.3%	37.2%	100	78
	12-18	1.4	9.2	13.5	75.9	100	141
	19-25	1.5	3.7	5.9	88.9	100	135
19-25	5-11	39.6%	21.5%	11.4%	27.5%	100	386
	12-18	5.6	15.7	17.8	60.8	100	835
	19-25	1.1	8.6	16.5	73.9	100	945
	Overall:	9.1%	12.6%	14.7%	63.6%	100%	
	No. of Cases	243	338	395	1707		2683

D. ACADEMIC APTITUDE

As discussed in Chapter 2, the Raven Progressive Matrices Test was incorporated into the testing plan in order to provide a control variable which would constitute a measure of the child's academic ability and which, unlike most such measures, would not be operationally dependent on a knowledge of the English language. Some evidence is presented in Appendix D that the Raven is performing as expected, and thus was a good choice as the study's measure of academic aptitude.

Table 4.13 shows the distribution of adjusted scores[1] for each of the three groups of students (LM-LEP, EP/LIS, and EP/Comp) for each of the two cohorts. It will be noted that for each of the resulting six groups almost the entire range of possible scores is covered. Furthermore, as shown in the bottom three rows of Table 4.14, the differences between the mean of the LM-LEP group and the means of the two English-proficient groups (though statistically significant) were comparatively small in both grades. The grade 3 difference, however, was a bit larger than the grade 1 difference. This is not surprising; the grade 3 cohort (Cohort B) does not include in its LM-LEP group any of the students who learned enough English before reaching grade 3 to have been exited from the program. Since ability to learn a foreign language (English, in this case) is correlated with academic ability, the systematic absence from Cohort B of part of this relatively rapid-learning segment of the population would tend to depress the mean score.

It is reasonable to ask why new arrivals in the United States who become members of Cohort B do not balance the loss of the segment of the population represented by the formerly LM-LEP students who exited before reaching grade 3. Let us call the students who were LM-LEPS in the school when they were

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[1] All data reported on Raven scores in this and subsequent chapters use "adjusted scores" rather than "rights scores". The distinction between these two types of scores, and our reason for preferring the former, are described in Chapter 2, Section 2H.1. Appendix D presents some data comparing the two types of scores.

TABLE 4.13. Distribution of Grade 1 and Grade 3 Raven total adjusted scores, for each group

Total score*	NO. OF CASES					
	Cohort A, Grade 1,CPM			Cohort B, Grade 3,SPM		
	LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
60				—	—	—
59				—	—	—
58				—	—	—
57				—	—	—
56				—	—	—
55				—	—	—
54				—	—	—
53				—	—	—
52				—	—	1
51				1	—	—
50				4	1	1
49				4	3	1
48				5	1	—
47				8	4	—
46				11	4	2
45				16	6	1
44				19	5	3
43				26	9	4
42				28	7	8
41				39	10	9
40				44	16	10
39				59	16	10
38				55	23	17
37				62	23	10
36	1	1	—	82	30	9
35	7	—	1	102	13	6
34	9	1	1	80	22	12
33	29	5	3	85	23	14
32	28	7	2	86	23	11
31	34	10	4	82	22	9
30	46	11	11	95	16	18
29	76	13	6	116	29	15
28	79	28	8	111	21	20
27	104	19	13	115	28	16
26	130	28	15	116	25	14
25	171	27	13	103	18	15
24	177	38	24	96	22	12
23	225	30	18	82	19	21
22	237	58	22	100	23	11
21	247	43	42	89	18	12
20	252	49	25	100	14	17
19	292	57	25	115	20	13
18	265	56	32	129	17	15
17	288	39	25	111	24	18
16	305	46	36	124	12	8
15	327	48	24	92	16	10
14	344	42	24	111	12	10
13	269	26	19	101	12	8
12	223	26	12	76	6	4
11	183	17	16	45	2	3
10	99	7	9	28	—	3
9	71	7	6	17	1	1
8	50	5	4	13	2	1
7	39	6	1	4	1	—
6	26	4	—	4	—	—
5	14	3	—	1	—	—
4	10	2	2	1	—	—
3	8	—	—	1	1	—
2	4	—	1	—	—	—
1	1	—	—	—	—	—
0	—	—	—	—	—	—
N	4670	759	444	2994	620	403

*The maximum possible score is 36 for the CPM (Grade 1) and 60 for the SPM (Grade 3).

in grade 1 and are still LM-LEPS in grade 3 "group 1"; and let us call the new immigrants who become members of Cohort B "group 2". Group 2 will presumably be representative of the general population in terms of academic aptitude; it will cover the full range of ability levels. Group 1, on the other hand, will not contain as large a proportion of members at the upper end of the academic aptitude scale as there are in the general population. If a group representative of the general population with respect to a certain variable (e.g., academic aptitude) is combined with an unrepresentative group, the combined group will also be unrepresentative (though to a lesser degree).

Rows 1-8 of Table 4.14 show the Raven means and standard deviations for LM-LEP students classified by native language category. The two groups with the highest Raven means are the students whose native language is Chinese (row 1) and students whose native language is non-European with a Latin Alphabet (row 5). This latter group consists mostly of Vietnamese and Filipinos. The three groups consisting largely of Asians (i.e., rows 5-7) have higher means than either of the English-proficient groups. The lowest mean scores belong to the two Romance language groups (rows 1 and 2), at least if we ignore the 63 Cohort B students in the "Unknown native language" category.

Table 4.15 shows, separately for the LM-LEP students and the English-proficient students, the correlations of the Raven with the various Stanford Achievement Test (SAT) scores. The correlations for LM-LEP students, which are shown in the left half of the table, were moderate. The correlations were generally higher with the mathematics tests than with the English tests (vocabulary and reading comprehension). The correlations with the English tests were, of course, depressed by the fact that the LM-LEP students were, to varying degrees, distinctly limited in their ability to handle English. This limitation affected their English scores, but not their Raven scores. The right-hand side of Table 4.15, which shows the corresponding correlations for the English-proficient students (the EP/Comp and EP/LIS groups combined) provides some confirmatory evidence for this

TABLE 4.14. Means and standard deviations of Raven total adjusted scores, with LM-LEP students classified in terms of native language category

Native Language Category	Cohort A, Grade 1 Raven CPM			Cohort B, Grade 3 Raven SPM		
	Mean	SD	N	Mean	SD	N
A. LM-LEP						
1. Spanish	17.89	5.63	3874	24.30	8.66	2451
2. Other Romance languages	16.91	5.18	98	24.78	9.26	77
3. Other European	19.67	6.16	30	27.27	7.96	26
4. Native American	—	—	0	26.56	6.46	9
5. Other Latin alphabet	20.99	5.68	91	33.50	9.84	42
6. Chinese	21.75	6.57	207	34.83	8.83	148
7. Other	20.00	6.41	250	29.64	9.56	178
8. Unknown	18.79	5.56	120	23.27	9.12	63
LM-LEP total*	18.25	5.80	4670	25.29	9.16	2994
B. EP/LIS*	19.54	5.71	759	28.26	8.97	620
C. EP/Comp*	19.18	5.68	444	27.10	8.92	403

*These data apply to the Table 4.13 distributions.

TABLE 4.15 Correlations of Raven Progressive Matrices total scores with Stanford Achievement Test scores

Separately for LM-LEP and English-proficient students*

	LM-LEP students			English-proficient students*		
	Correlation of Raven total with:			Correlation of Raven total with:		
SAT Score	Primary 1 Spr.'85 Cohort A Grade 1	Primary 2 Fall'84 Cohort B Grade 3	Primary 3 Spr.'85 Cohort B Grade 3	Primary 1 Spr.'85 Cohort A Grade 1	Primary 2 Fall'84 Cohort B Grade 3	Primary 3 Spr.'85 Cohort B Grade 3
English						
Vocab.	.258	.202	.185	.359	.412	.420
Rdg.Comp.	.339	.348	.340	.377	.429	.500
Eng.Total	.349	.338	.323	.414	.473	.514
Math						
Concepts of No.	.423	.456	.488	.441	.496	.542
Computation	.348	.357	.357	.395	.453	.410
Applications	.417	.386	.435	.431	.508	.534
Comput.+Applic.	.432	.426	.439	.455	.538	.527
Math Total	.455	.466	.482	.475	.555	.566
English + Math Total	.446	.466	.464	.481	.568	.583
No. of cases	2319	1538		816	606	

*The English-proficient students include both the EP/LIS and EP/Comp groups.

hypothesis: the correlations of the Raven with the various SAT scores for English-proficient students were higher than the corresponding correlations for LM-LEP students, in both grades.

The LM-LEP status of the children did not affect their math scores nearly as much as it affected their English scores. That is probably a major reason (though possibly not the sole reason) why the SAT math tests correlated higher with the Raven than did the English tests. Confirmatory evidence for this, too, is provided by the correlations of Raven with SAT for the English-proficient students. The amount by which these correlations exceeded the corresponding correlations for the LM-LEP students is generally higher for the English scores than for the math scores.

The Raven, unlike the SAT, was essentially uncorrelated with number of years in the United States. This is shown in Table 4.16. The fact that the Raven and time in the U.S. was uncorrelated will make it possible for the Raven to provide an effective control on academic aptitude, operationally independent of knowledge of English. It is not being assumed that the Raven is generally uncorrelated with English. For people whose native language is English, and who live in an English-speaking country, ability in English is definitely and substantially correlated with the Raven. For people with any other native language who live in a country where that language is spoken, the Raven will be correlated with ability in that language. Thus the Raven provides a measure of academic aptitude that is not distorted by lack of knowledge of English. A student who knows no English at all could conceivably get a perfect score on the Raven. That student, because of his high academic aptitude, would probably have no trouble at all in learning to speak and write excellent English, and to read English fluently.

Correlations of various other variables with the Raven also turned out much as expected. As shown in Table 4.16, for the grade 1 LM-LEPs (the Cohort A sample), age in months was slightly correlated with the Raven. Obviously over the full range of ages that the Raven series is intended to span, extending from preschool to adult, the correlation would be extremely high; when the age range is so much narrower that age has to be expressed in months, as in the case of a grade 1 sample, the correlation is expected to

TABLE 4.16. Correlation of Raven Progressive Matrices total score with miscellaneous variables, for LM-LEP students

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Correlations with Raven		AUXILIARY DATA						
			Mean		S.D.		No. of cases		Maximum possible range (From-To)
Variable	Cohort A Grade 1	Cohort B Grade 3	Cohort A Grade 1	Cohort B Grade 3	Cohort A Grade 1	Cohort B Grade 1	Cohort A Grade 1	Cohort B Grade 3	
1. No. of years in United States	-.013	-.034	5.35	6.32	1.90	2.88	2941	1977	--
2. Age in months	.102	-.026	85.15	108.98	6.44	8.89	2941	1977	--
3. English SOPR	.166	.127	14.25	16.54	5.95	5.27	2941	1977	5-25
4. Native language SOPR	.099	.062	20.90	21.31	5.19	4.87	2941	1977	5-25
5. Parents' education[a]	.090	..056	7.62	7.39	3.72	3.50	2941	1977	0-14
6. Parents' use of English in the home[b]	.030	-.013	.60	.59	.94	.96	2941	1977	0-4
7. English reading matter in the home[b]	.026	.024	.99	.99	.87	.87	1011	699	0-2
8. Non-English reading matter in the home[b]	.044	.054	.56	.61	.80	.82	1011	699	0-2
9. Reading matter in the home[b]	.050	.053	1.55	1.59	1.17	1.22	1011	699	0-4
10. Socioeconomic status[b]	.163	.011	14.91	14.13	5.35	5.23	1011	699	3-29
11. Raven total	--	--	18.36	24.87	5.73	9.00	2941	1977	Grade 1 0-36 (CPM) Grade 3 0-60 (SPM)

[a] This variable is described in Chapter 8, on page 8-17.

[b] This variable is described in Appendix B.

be very greatly reduced. However it was still significantly greater than zero. That is not true for grade 3 LM-LEP students; in that sample, age in months and Raven total were virtually uncorrelated. The explanation for this result probably lies in the nature of the sample. The third-grade LM-LEP sample probably includes some students who, because of poor academic aptitude, are over-age for the grade level, having been previously retained in grade at least once. Such students would tend to cancel whatever correlation between age and Raven exists in an unselected group (e.g. all eight-year-olds, regardless of grade).

Other variables in Table 4.16 are total scores on the SOPRs (native language SOPR and English SOPR), parents' education, parents' use of English in the home, reading materials in the home (English and non-English materials separately) and socioeconomic status. The parents' education variable is a weighted average of the father's and mother's numbers of years of schooling (with triple weighting of the more educated parent). The "parents' use of English in the home" variable is on a five-point scale, as follows:

4 = all English
3 = mostly English*
2 = both English and some other language*
1 = mostly some other language*
0 = entirely some other language.

The correlations of the Raven with the SOPRs were slight, but consistently positive. (All four were significantly greater than zero.) This is in line with expectation; some correlation is to be expected since verbal ability is one of the aspects of academic aptitude; but the correlation is necessarily low because of the LM-LEP status of the students, with their varying combinations of proficiency in their native languages and in English. It was perhaps worth noting that the correlation with the English SOPR is higher than with the native language SOPR.

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*This is a slight oversimplification of scale values 1, 2, and 3. Readers who wish a more precise explanation are referred to Appendix B, Section 5

There are several possible explanations for this, but the most likely one seems to be that in most of the schools gaining proficiency in English is probably emphasized more than gaining or maintaining proficiency in the native language, and thus is a manifestation of the academic aptitude measured by the Raven. Data presented in Table 4.17 demonstrate that most of the differences in Raven between successive SOPR score levels are slight. On the native language SOPR there are some actual reversals, but they are small, and almost certainly due to chance.

As shown in Table 4.16, correlations between the Raven and parents' education were very low (though significantly greater than zero). One of the factors depressing the correlations is probably the very large number of immigrants among the parent population, many of them coming from countries where formal education is not as readily available or as common as in the United States.

The data of Table 4.16 provide two surprises. One of them is provided by the three variables representing presence of reading matter (newspapers and magazines) in the home--(1) English-language matter, (2) other, and (3) reading matter irrespective of language; their correlations with the Raven are all very low--not significantly different from zero. High correlations were not expected but at least for variable 9 in the table (reading matter irrespective of language) a correlation significantly different from zero (even though low) would have been less unexpected. If the standard deviations had been small it would have explained the very low correlations, but the standard deviations are in fact quite substantial; as can be seen in Table 4.16 by comparing columns 5 and 6 (standard deviations) with column 9 (possible range) the standard deviations for variable 9 in both cohorts were about 30 percent of the possible range. Possibly the results would have been somewhat different if the reading matter with which the Parent Questionnaire item was concerned had included books, rather than just newspapers and magazines.

TABLE 4.17. Means and standard deviations on Raven for students classified in terms of their SOPR scores

SOPR Total Score	Eng. SOPR →	Cohort A, Grade 1			Cohort B, Grade 3		
		5-11	12-18	19-25	5-11	12-18	19-25
Native lang. SOPR ↓		Raven CPM			Raven SPM		
19-25	$\bar{X}$	17.6	18.7	19.4	24.0	25.0	26.2
	σ	5.6	5.6	5.8	9.7	9.1	8.9
	N	980	895	810	355	744	810
12-18	$\bar{X}$	16.3	17.4	18.5	19.9	21.7	25.7
	σ	5.6	5.3	5.6	6.6	7.9	9.2
	N	220	248	126	69	134	135
5-11	$\bar{X}$	14.7	15.7	19.2	21.1	24.3	24.9
	σ	5.3	5.3	5.5	7.4	8.4	8.9
	N	116	50	145	36	49	79

TABLE 4.18. Intercorrelations among five variables: Raven, SES, and three reading-matter-in-the-home variables

Based on LM-LEP students

				(1)	(2)	(3a)	(3b)	(3c)		
				CORRELATION COEFFICIENTS						
						Reading matter				
Cohort	Grade	N	Variables	Raven	SES	English	Other	All	Mean	S.D.
A	1	1011	1. Raven total		.163	.026	.044	.050	19.15	5.82
			2. Socioeconomic status*			.391	.032	.313	14.91	5.35
			3. Reading matter in the home*							
			a. In English*				-.030	.725	.99	.87
			b. In another language*					.666	.56	.80
			c. All*						1.55	1.17
B	3	699	1. Raven total		.011	.024	.054	.053	26.28	9.22
			2. Socioeconomic status*			.358	-.065	.212	14.13	5.23
			3. Reading matter in the home*							
			a. In English*				.044	.743	.99	.87
			b. Other*					.701	.61	.82
			c. All*						1.59	1.22

*Variables described in Appendix B.

The other surprise in Table 4.16 is the fact that in Cohort B (unlike Cohort A) socioeconomic status was not correlated significantly with the Raven. The reason for the discrepancy between cohorts in this regard is not clear. It is too large to be attributable to sampling error. Conceivably it is related somehow to the anomaly regarding the "reading matter" correlation with the Raven, discussed in the previous paragraph. In this connection it is perhaps worth mentioning that the presence of English reading matter in the home is substantially correlated with socioeconomic status in both cohorts, while the correlation of non-English reading matter is essentially zero with both socioeconomic index and other English-language reading matter. Table 4.18 summarizes these data, for the convenience of those readers who wish to puzzle over them.

Correlations of the Raven with the parents' use of English in the home were essentially zero, like its correlations with length of time in the U.S., and for about the same reasons.

4E

E. SUMMARY

This chapter presents a discussion of student characteristics which are expected to be related to the acquisition of English and the ability to function successfully in academic settings. A key finding is that there were language group differences for several of the student background characteristics.

Spanish language students were found to have been in the U.S. for longer periods of time than were the Chinese or other students. Students in the Chinese language group were generally found to have been in the U.S. for the shortest period of time.

Students were rated on oral proficiency in English and in their native language. The Spanish language students were more frequently rated as low in English oral proficiency than were Chinese or other language students. In comparison to Spanish language and Chinese language students other language students were more likely to be rated as fluent or as at a native speaker level of oral proficiency in English.

With regard to native language oral proficiency, the major proportion of students in each of the language groups was rated as fluent or as at a native speaker level of proficiency. Only a very small proportion of the Chinese language students were rated at a low proficiency level in Chinese; there were more such low ratings for the Spanish language and other language students.

Time in the U.S. was related to oral proficiency ratings in English and in the native language. Generally, for longer periods of time in the U.S., English language oral proficiency was rated higher and native language proficiency was rated slightly lower.

The Raven's correlations with other variables turned out much as expected (and hoped for). Correlations with SAT scores were moderate; correlations with students' age (in grade 1) and with parents' education were slight; and correlations with time in the United States and parents' use of English in the home were essentially zero. This latter finding (the zero correlations of the Raven with time in the U.S. and with parents' use of English) is crucial in justifying the use of the Raven to provide an effective control on academic aptitude, operationally independent of knowledge of English. Further support is provided by a comparison between the correlations based on LM-LEP students and the corresponding correlations based on English-proficient students. The latter are generally higher, the difference being more pronounced for the English tests than the math tests. All of these findings are entirely compatible with the hypothesis that though the limited English proficiency of the LM-LEP students depresses their SAT scores, particularly on the English tests, it does not affect their Raven scores.

In summary, then, the entire pattern of correlational and other empirical evidence available fully supports use of the Raven as the study's measure of academic aptitude.

CHAPTER 5

SCHOOL CONTEXT

Chapter 5. SCHOOL CONTEXT[1]

5A A. INTRODUCTION

School context refers to the overall school environment in which the educational process takes place. (See Anderson, 1982, for review.) A number of context variables identified through the literature to be important contributors to student achievement outcomes were selected to be used in the Longitudinal Study analysis. These variables included the type of neighborhood in which the school is located, size of enrollment, school academic climate, school language environment, provision of teacher training, and principal and parental involvement in the educational process.

It should be noted that the unit of analysis for this chapter is the school. This is unlike data reported in the rest of the report where students are the unit of analysis. For the Year 2 and Year 3 reports, however, the plan is to link the school level data described here with student records and to enter these variables into student-level analyses.

The data for this chapter come from the principals and teachers working in the 86 study schools. Each principal or other appropriate individual furnished the data requested by completing the following three questionnaires: the School District Policy Questionnnaire, the School Summary Form, and the Principal Questionnaire. Classroom teachers providing direct classroom instruction to study students provided data through their responses to the Instructional Staff Questionnaire.

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[1] Abbreviations and other special terms used in this study are defined in the glossary in Appendix A.

5B B. CHARACTERISTICS OF THE STUDENT BODY

Variables relating to characteristics of the study body of a school can be important in understanding the school context. Specifically, two variables, the socioeconomic status of the neighborhood in which the school is located and the size of the school enrollment were selected to be entered into the analysis.

5B.1 NEIGHBORHOOD OF THE SCHOOL

The kind of neighborhood in which a school is located can be a useful indicator of the socioeconomic status of students, and thus can be a barometer of schooling factors including the type of technological, curriculum, and personnel resources available to students (Brookover & Schneider, 1975; Brookover & Lezotte, 1979; McDill & Rigsby, 1973). The data for this variable were taken from the Principal Questionnaire where respondents characterized school neighborhoods to be one of the following: 1) affluent, 2) a mix of middle income and affluent, 3) middle income, 4) mix of low and middle income, or 5) low income. No schools were identified to be in affluent, or a mix of middle income and affluent neighborhoods. In equal proportion, the schools were categorized as being in a mix of low and middle income neighborhoods or in low income neighborhoods, 46.8 percent in each category. The rest, 6.3 percent of the schools were considered to be in middle income neighborhoods.

5B.2 SCHOOL ENROLLMENT

School size is a variable that has been found to affect how students are supported and challenged in the educational process (Flagg, 1964; Morocco, 1978). For LM-LEP students this is particularly important because it may influence how quickly they learn English and how comfortable they feel in the academic program being provided in school, both being factors that may ultimately influence student achievement.

For the 86 elementary schools that participated in the study in Year 1, the grade 1-5 enrollment ranged from 123 to 1,482. Table 5.1 provides an overview of the number and percentage of the schools in the study based on the grade 1-5 enrollment. The percentage of total enrollment of LM-LEP students in the schools in grades one to five is given in Table 5.2.

TABLE 5.1. School enrollment in grades 1-5

Enrollment in Grades 1-5	Number of Schools	Percentage
100-250	10	12%
250-400	18	21
401-600	19	22
601-800	26	30
801-1000	6	7
1001-1500	7	8
Total	86	100%

TABLE 5.2. Percentage of total enrollment in grades 1-5 who are LM-LEP students

Percent LM-LEP of Total Enrollment	Number of Schools	Percentage
0-20	12	14%
21-40	37	43
41-60	21	24
61-80	8	9
81-100	8	9
Total	86	100%

5C C. ACADEMIC CLIMATE

Two variables were selected as measures of academic climate. They are the schools' academic standing within their district and state and the school's overall emphasis on academics.

5C.1 SCHOOL PERFORMANCE ON ACHIEVEMENT TESTS

The academic standing of the schools is considered an important variable because it ultimately influences expectations for student academic achievement (Andrews, 1965; Lezotte & Passalacqua, 1978; Brookover & Schneider, 1975). The indicator used to measure academic status was the relative performance of the schools on reading and mathematics achievement tests.

The data for this variable were derived from responses to a question asking where the school stands in relationship to other district schools and to other elementary schools within the state. Table 5.3 displays the relative performance of schools in the study in reading and mathematics for both the district and the state.

As shown in the table, the majority of the schools for which data were available rank at the middle fifth or higher in both reading and mathematics in comparison with other schools in their districts. However, the study schools' academic standing in the state is lower in both subject areas, particularly in reading. The high LM-LEP enrollment, with a large number of students with limited English language proficiency, may be one reason for the discrepancy between the district and state rankings in reading. Students' higher performance in mathematics at both the state and district levels may be because English language proficiency is not as essential for LM-LEP students to do well in mathematics tests.

TABLE 5.3. School academic standing based on reading and mathematics achievement tests

Academic Standing of Schools in the Study	Comparison of Each School with All Elementary Schools in the District: Reading N	Reading %	Mathematics N	Mathematics %	Comparison of Each School with All Elementary Schools in the State: Reading N	Reading %	Mathematics N	Mathematics %
Top 5th	7	8%	8	9%	1	1%	1	1%
Next-to-top 5th	11	13	12	14	1	1	3	3
Middle 5th	26	30	27	31	15	17	19	22
Next-to-bottom 5th	13	15	9	10	10	12	4	5
Bottom 5th	8	9	7	8	10	12	9	10
Information not available or provided	21	24	23	27	49	57	50	58
Total	86	100%	86	100%	86	100%	86	100%

5C.2 SCHOOL EMPHASIS ON ACADEMICS

To describe the study schools' academic environment further, a composite variable was created from the responses to three items. One item in the composite relates to changes made in the school curriculum, school day, or staffing structure to improve student academic performance. Eighty-one percent of the principals indicated that over the past two years such changes had been made. The other two items in the composite relate to whether public recognition or rewards are provided to students and teachers for outstanding academic performance. Ninety percent of the principals indicated that students were rewarded and fifty percent indicated that a reward system existed for teachers.

The measure of school emphasis on academics was created by adding the responses to each of the three items, weighting the responses, "yes" as 2 and "no" as 1. The results for this measure are presented on Table 5.4. The higher the score the stronger the emphasis on academics. As shown in the table, the majority of the study schools rate high on this composite.

TABLE 5.4. School emphasis on academics

Composite Score*	Number of Schools	Percentage
3	3	4%
4	9	13
5	28	39
6	32	44
Total	72	100%

*The composite score was created by adding the weighted responses to three items: changes in school curriculum, public recognition of teachers, and public recognition of students.

5D

D. SCHOOL LANGUAGE ENVIRONMENT

Because students' English language proficiency is an important factor in the educational attainment of LM-LEP students (Hansen, Johnson, & Santee, undated), variables that affect the overall school language environment were identified. They include school district policies relative to the use of

English and other languages both within and outside the instructional context, the principals' language background, the principals' attitudes toward the use of non-English languages in the school, and the use of English and other languages outside the classroom by principals, teachers, and students.

5D.1 SCHOOL DISTRICT POLICY TOWARD THE USE OF LANGUAGES OTHER THAN ENGLISH

School district policy toward the use of non-English languages provides a measure of the specialized resources available to assist LM-LEP children in the educational process. A specific district policy can also influence how instructional staff interact and react to LM-LEP students.

The data related to school policy toward the use of languages other than English are taken from responses to two questions in the School District Policy Questionnaire. In 94 percent of those schools for which responses were provided, respondents indicated that there was a district policy concerning the teaching of languages other than English as a subject area in the elementary grades; LM-LEP students may receive instruction in the oral and/or written language arts of their native language in 75 percent of the schools. In 5 percent of the schools, the policy is to encourage all students to learn a language other than English. In 49 percent of the schools, both policies exist: LM-LEP students may receive instruction in oral and/or written language arts of their native language and all students are encouraged to learn a language other than English. Ninety percent of the schools also have a permissive policy stipulating that the native languages of LM-LEP students may be used to provide special instructional services. Four percent of the schools were in districts having no specific policy in either area.

5D.2 PRINCIPALS' LANGUAGE BACKGROUND

The language background of principals was selected as a variable for the study because it was hypothesized that principals who speak a language other than English may be more sensitive to the needs of LM-LEP students and thus influence the school philosophy relative to the teaching of LM-LEP students. The data for the variable were taken from the principals' descriptions of their experiences using English and, if applicable, their backgrounds in using other languages. They indicated how many of the following statements fit their experience for English and the other language: 1) the language was their native language, 2) it was a language used extensively since childhood, 3) it was a language of instruction for their elementary or secondary education, 4) it was the language of instruction for their college or university studies, or 5) it was a language they studied as a foreign language. Two composite scores were thus created for the principals' English and other language backgrounds. The results are displayed in Table 5.5. A higher score on either composite indicates a stronger language background in that particular language.

As shown on the table, all principals have a strong base in English. Sixty-seven percent also have some background in another language.

TABLE 5.5. Principals' English and other language background

Composite Score*	English Language Background		Other Language Background	
	N	%	N	%
0	0	0%	25	33%
1	0	0	26	35
2	8	11	21	28
3	16	21	2	3
4	51	68	1	1
Total	75	100%	75	100%

*The two composite scores were created by adding the principals' responses to five specific questions concerning their uses of English and other languages. A score of 0 indicates no background, while a score of 4 indicates a very extensive background.

To provide an integrated description of the principals' experience in both English and another language, another composite variable classifying principals' language background was created. On this variable, principals were categorized as monolingual or bilingual.[1] Those classified as monolingual were either native speakers of English or native speakers of a another language. The classification of bilingual was used to refer to several categories of individuals: 1) those who are English speakers and who have learned a foreign language through formal study only; 2) those who are speakers of a language other than English and who have learned English through formal study only; and 3) those whose bilingualism is based on experience rather than formal study only. The results of this classification, found in Table 5.6, indicate that 66 percent of the principals were bilingual.

TABLE 5.6. Principals' overall language background

Language Background	Number of Principals	Percentage
Monolingual		
English	25	34%
Language other than English	0	0
Bilingual		
English speaker with formal study only of a non-English language	22	30
Speaker of a language other than English with formal study only of English	0	0
Bilingual through experience other than formal study only	27	36
Total	74	100%

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[1] In addition to rating their experience with English, the principals were asked to indicate their level of experience, if any, in the language other than English in which they were most proficient. Thus, some of the respondents included in the bilingual categories may also have had experience with a third language.

5D.3 PRINCIPAL ATTITUDES TOWARD THE USE OF NON-ENGLISH LANGUAGES IN THE SCHOOL

The learning environment in a school can be greatly influenced by the philosophy principals have toward the use of languages other than English. In particular, their reactions can affect the attitudes of their staff toward LM-LEP students.

As shown in Table 5.7 no study schools prohibit or discourage the use of non-English languages outside of the classroom. Thirty six percent of the schools permit the use of non-English languages and 21 percent encourage their use.

TABLE 5.7. School policy concerning the use of languages other than English by instructional staff in interactions with students outside the classroom

Policy Concerning the Use of Languages Other than English	Number of Schools	Percentage
Prohibited	0	0%
Discouraged	0	0
Permitted	27	37
Encouraged	16	22
No policy	30	41
Total	73	100%

A composite variable describing principals' attitudes towards the use of the native language in instruction for LM-LEP students was derived from their responses to a series of statements related to their educational philosophy. The seven statements used to create the composite were:

1. LM-LEP students should develop skills in their native language similar to the skills they develop in English.
2. LM-LEP students learn to read English more easily if they are first taught to read their native language.
3. How well LM-LEP students know their native language should be a key factor in deciding how and what to teach them.
4. LM-LEP students who are taught to read in both English and their native language will eventually achieve more academically than will those who are taught to read only in English.
5. Learning content area knowledge in two languages places an unnecessary burden on LM-LEP students.
6. As soon as LM-LEP students have learned good conversational English, they should be given content area instruction entirely in English.
7. LM-LEP students' native languages should be used only to support instruction given in English, not to provide primary instruction.

Items were rated on a five point scale: "strongly disagree" scored as 1, "disagree" scored as 2, "no opinion" scored as 3, "agree" scored as 4, "strongly agree" scored as 5. The ratings for items 5 to 7 were reversed so that a high score, in all cases, reflected positive support for use of the native language in instruction. The mean score across items was thus obtained for each principal. The distribution for the composite is found in Table 5.8.

As shown on the table approximately 79 percent of the principals scored on the positive side of the scale measuring support for the use of non-English languages in instruction. The remaining 21 percent scored on the negative side, indicating that they do not support the use of non-English languages in instruction.

5D.4 USE OF LANGUAGES OTHER THAN ENGLISH IN NON-INSTRUCTIONAL CONTEXTS

The extent to which LM-LEP students, teachers, and other staff use a language other than English in non-instructional situations is another useful indicator of school language environment.

TABLE 5.8. Principals' support for the use of languages other than English in instruction

Mean Score*	Number of Principals	Percentage
1.0-2.0	3	4%
2.1-3.0	13	17
3.1-4.0	39	52
4.1-5.0	20	27
Total	75	100%

*The mean score is based on a five point scale: strongly agree = 1; disagree = 2; no opinion = 3; agree = 4; strongly agree = 5. The ratings were such that a high score in all cases reflected positive support for use of the native language in instruction.

A composite variable was therefore created that describes the extent to which principals, teachers, and students use a language other than English outside the classroom context. The composite is composed of three items: 1)The extent to which teachers use non-English languages when interacting with LM-LEP students; 2) the extent to which LM-LEP and English-proficient students use English when interacting outside the classroom; and 3) principals' use of a language other than English with non-English speaking students. A higher score on this composite indicates greater use of a language other than English. The distribution of this composite is shown in Table 5.9.

TABLE 5.9. Extent of non-English language use outside the classroom by principals, teachers, and students

Composite* Score	Number of Schools	Percentage
3.0-4.0	17	23%
4.1-5.0	34	45
5.1-6.0	24	32
Total	75	100%

*The composite variable was created by combining responses from the three items: 1)The extent to which teachers use non-English languages when interacting with LM-LEP students; 2) the extent to which LM-LEP and English-proficient students use English when interacting outside the classroom; and 3) principals' use of a language other than English with non-English speaking students. A higher score indicates greater non-English language use.

5E E. PROVISION OF TEACHER TRAINING RELEVANT TO LM-LEP STUDENTS

Districts and schools differ in the extent to which teachers of LM-LEP students are offered and encouraged to take pre-service or in-service courses specifically designed to aid in teaching LM-LEP students. The presence and extensiveness of such courses provides evidence of the school system's commitment to quality education for LM-LEP students.

Overall, 86 percent of schools reported the presence of pre-service or in-service training for teachers to assist in the instruction of LM-LEP students. Table 5.10 shows the areas in which training was most frequently provided. Training related to the teaching of English as a Second Language (ESL) was most frequently offered to teachers.

TABLE 5.10. Areas in which pre-service or in-service training are provided to teachers

Training Area	No. of Schools	Percentage
1) Teaching English as a Second Language (ESL)	64	79%
2) Teaching math, science or social studies in English to LM-LEP students	48	59%
3) Teaching the language arts of the native language to LM-LEP students	48	59%
4) Teaching math, science, or social studies in the native language to LM-LEP students	42	52%
5) Teaching history, cultural or ethnic studies associated with the background of LM-LEP students	39	48%

The total number of hours of pre-service or in-service training related to teaching LM-LEP students and offered in the last year provides an indication of the extensiveness of training. Of those reporting hours, 20 schools reported 1-9 hours, 17 schools reported 10-19 hours, 15 schools reported 20-39 hours, and 10 schools reported 40 or more hours.

A composite of the extensiveness of training was developed based on the number of areas (breadth) of training, and the total hours of training in the past year. The composite ranged from a value of 0 (no training) to 10. The distribution of schools on this composite is shown in Table 5.11.

TABLE 5.11. Extensiveness of pre-service and in-service training provided by schools to assist teachers of LM-LEP students

Extensiveness Composite Score	Number of Schools	Percentage
0	11	14%
2	2	2
3	10	12
4	6	7
5	10	12
6	7	9
7	6	7
8	14	17
9	9	11
10	6	7
Total	81	100%

5F F. PRINCIPALS' INVOLVEMENT

The principal of a school can have a considerable influence on the spirit and vitality of the school, and also on the extent of striving for academic excellence (Kean, Summers, Raivetz, & Farber, 1979; Pinck, with Wolfsfeld, 1978). In the previous section, principals' language background and language attitudes were discussed. In this section four other characteristics of the principal are discussed: 1) attitudes toward and involvement with LM-LEP services; 2) knowledge of and involvement with students; 3) interaction level with teachers; and 4) influence on curriculum and teaching methods.

5F.1 PRINCIPALS' ATTITUDES TOWARD LM-LEP SERVICES

Two questions were asked which related to the principal's attitudes towards special services for LM-LEP students. The most direct measure came from teachers, who rated the principal's attitude towards special services on a scale from strong opposition (1) to strong support (5). The mean rating of teachers was calculated for each school, and the distribution of those means is shown in Table 5.12. The results indicate that a large majority of principals were perceived as showing "strong support" for such services.

The second measure of principal attitudes towards special services came from the principals' reports of how many hours in the school year they had personally devoted to planning, monitoring, or supervising special services to LM-LEP students. Of the 67 principals providing responses, 16 reported spending 0-9 hours, 15 reported 10-19 hours, 15 reported 20-35 hours, 12 reported 36-59 hours, and 9 reported 60 or more hours.

These two measures were combined into a composite of principal support for special services in which the two items were weighted approximately equally. The composite scores ranged from 4 to 10, with a higher score indicating greater principal support and involvement in special services for LM-LEP students. A distribution of scores on this composite is presented in Table 5.13.

5F.2 PRINCIPALS' INVOLVEMENT WITH STUDENTS

A principal who has extensive contact with and knowledge of students may have a greater sense of student attitudes and abilities than a less involved principal. Two measures of principal involvement with students were therefore included in the study.

TABLE 5.12. Teacher ratings of principals' support for special services for LM-LEP students

Mean Rating*	Number of Schools	Percentage
1.0-1.99	0	0%
2.0-2.99	0	0
3.0-3.49	1	1
3.5-3.99	2	2
4.0-4.49	14	16
4.5-5.0	69	80
Total	86	100%

*The score reported was a mean rating across teachers in a school. The scale was: strong opposition = 1, moderate opposition = 2, neither opposition nor support = 3, moderate support = 4, strong support = 5.

TABLE 5.13. Principals' support for and involvement in special services for LM-LEP students

Composite Score*	Number of Schools	Percentage
4.0-4.99	1	1
5.0-5.99	13	19
6.0-6.99	14	21
7.0-7.99	16	24
8.0-8.99	12	18
9.0-10.0	11	16
Total	67	100%

*This composite includes a measure of principal support for special services for LM-LEP students as rated by teachers, and a measure of the hours the principal spent in the school year planning, monitoring, or supervising such services. A higher score represents greater support.

First, teachers were asked to rate the extent to which the principal knew about the school or life experiences of individual students in their classes ("very little" = 1, "a moderate amount" = 2, or "quite a lot" = 3). Mean teacher ratings on this item were then calculated for each school. The results indicated that the mean teacher rating was between 1 and 1.5 in no schools, between 1.5 and 2 in 23% of schools, between 2 and 2.5 in 42 percent of schools, and between 2.5 and 3 in 35 percent of schools.

Second, principals themselves reported how often in a typical school week they had conversations of at least five minutes with individual students about their school or life experiences (not including disciplinary interactions). Of the 69 principals who responded, 15 reported 2 or fewer such conversations per week, 17 reported 3-5 conversations, 11 reported 7-10 conversations, 17 reported 11-20 conversations, and 9 reported more than 20 conversations.

The two variables were combined into a composite of principals' involvement with students. The composite scores ranged from 4 to 11, with a higher score indicating greater involvement by the principal. A distribution of scores on the composite is presented in Table 5.14.

5F.3 PRINCIPALS' INTERACTIONS WITH TEACHERS

A principal who has frequent interactions with teachers may have greater ability to influence instructional practices and outcomes than a principal who has fewer interactions. The study asked three questions of principals relating to this issue: 1) the number of group meetings with teachers during the school year to discuss curricular and teaching issues; 2) the number of meetings with individual teachers in the school year to discuss curricular and teaching issues; and 3) the number of hours in the school year devoted to observing classroom instruction. Principals reported a median of 10 group meetings with teachers, a median of 30 meetings with individual teachers, and a median of 80 hours of classroom observation.

TABLE 5.14. Principals' knowledge of and involvement with students

Composite Score	Number of Schools	Percentage
4.0-4.99	6	9%
5.0-5.99	11	16
6.0-6.99	10	14
7.0-7.99	14	20
8.0-8.99	12	17
9.0-9.99	10	14
10.0-11.0	6	9
Total	69	100%

In order to create a composite, principals were divided into five approximately equal-sized groups on each of the three variables, and given a score of 1 to 5 based on that categorization. The three scores were then added to create a composite with a range of 3 to 15. The distribution of scores on this composite of principal interactions with teachers is shown in Table 5.15.

5F.4 EXTENT PRINCIPALS' PHILOSOPHY IS REFLECTED IN SCHOOL CURRICULA AND METHODS

Principals and teachers were both asked to rate the extent to which the principal's educational philosophy and values were reflected in the curricula and teaching methods used by teachers. The response alternatives were 1 = not at all, 2 = to a slight extent, 3 = moderately well, and 4 = very well. The mean response of the teachers was then calculated for each school.

TABLE 5.15. Extensiveness of principal interactions with teachers relating to instruction

Composite Score	Number of Schools	Percentage
3	2	3
4	7	11
5	4	6
6	4	6
7	3	5
8	7	11
9	8	13
10	9	14
11	5	8
12	6	9
13	6	9
14	2	3
15	1	2
Total	64	100%

Table 5.16 shows the distributions of scores on these items. For principals, the table shows the actual distribution of responses, while for teachers the table shows the distribution of school means across teachers. As the data from teachers and principals show, principals' philosophies and values are reflected to at least a moderate extent in the great majority of schools.

TABLE 5.16. Ratings by principals and teachers of the extent to which the principal's philosophy and values are reflected in school curricula and methods

Rating or Range of Ratings*	Rating by Principals		Mean Rating by Teachers	
	Number of Schools	Percentage	Number of Schools	Percentage
1	0	0%	0%	0%
2	4	5	13	15
3	41	56	61	71
4	28	38	12	14
Total	73	100%	86	100%

*Ratings by both principals and teachers are presented at the school level. For principals this is an actual rating, while for teachers it is a school mean rounded to the nearest whole number. The scale is: 1 = not at all, 2 = to a slight extent, 3 = moderately well, 4 = very well.

A composite score on this variable was created by combining the principal rating with the mean teacher rating in the same school. The mean teacher rating was weighted approximately twice as high as the principal rating, to reflect teachers' greater knowledge of actual classroom practice. The resulting composite had a range from 6.75 to 11.4. The distribution of composite scores is presented in Table 5.17. The results indicate that there is considerable variation among schools in the study.

TABLE 5.17. Extent to which the principal's philosophy and values are reflected in school curricula and methods

Composite Score*	Number of Schools	Percentage
6.75- 7.99	12	16%
8.00- 8.99	10	14
9.00- 9.99	30	41
10.00-11.40	21	29
Total	73	100%

*This composite is a combination of principal and teacher ratings, with the mean teacher rating in a school weighted twice that of the principal rating. A higher score means that principals' philosophy and values were reported to be more reflected in the school's curricula and methods.

5G G. ATTITUDES OF NON-LANGUAGE-MINORITY PARENTS

The community environment in which LM-LEP student receive services also may have an indirect influence on the nature and results of those services. In order to examine community attitudes, principals were asked about the attitudes of non-language-minority parents concerning the presence of LM-LEP students in the school, and the attitudes of those parents concerning special services provided to LM-LEP students.

Of the 69 principals providing responses, 2 said that non-language-minority parents were "generally negative" concerning the presence of LM-LEP students, 16 said they were "about equally positive and negative," 33 said they were "generally positive," and 18 said they were "very positive." On the issue of LM-LEP services, of the 68 principals responding, 2 principals said that non-language-minority parents "generally oppose such services," 24 said that parents "have no real feelings one way or another about such services," and 42 said that parents "are generally in favor of such services."

A composite of the attitudes of non-language-minority parents was created by combining responses from these two items. The composite scores ranged from 4 to 8. The distribution of those scores is shown in Table 5.18.

TABLE 5.18. Attitudes of non-language-minority parents concerning the presence of and service for LM-LEP students.

Composite Score*	Number of Schools	Percentage
4	1	2%
5	9	14
6	17	27
7	22	34
8	15	23
Total	64	100%

*This composite includes two items concerning attitudes toward the presence of LM-LEP students in the school, and towards special services for those LM-LEP students. A higher score represents more positive attitudes.

5H

H. POLICIES AND PRACTICES RELATING TO ENTRY AND EXIT FROM LM-LEP SERVICES

Another important aspect of school context is the practices and procedures through which students are identified as limited-English-proficient, enter into educational programs designed for them, and eventually leave these programs. An understanding of these processes contributes to overall study objectives in two ways. It can suggest the need to define new variables which will enter into subsequent data analyses and, also, it can provide a valuable explanatory context which will clarify how certain observed relationships came to be. In the discussion that follows attention will be directed especially to three crucial selection factors--instructional programs available, space available, and reassignment philosophy.

5H.1 BECOMING A LEP

From the perspective of the child, the process of receiving LM-LEP services usually begins with a decision by the school that he or she might be eligible for or benefit from the various special services the school is able to provide. From this pool of children who might be LM-LEP, the schools must determine in some way, usually through testing, who is and who is not LM-LEP according to the district definition. As shown in Table 5.19, the predominant means of determining who might be LM-LEP was to have the parents complete a home language survey. Usually such questionnaires included a question similar to that used by one large school system in the study: "What language is customarily used at home?"

As an alternative to a home language survey, many schools simply asked parents the relevant questions when they came to enroll the child in the school.

A third procedure was to rely on the judgment of the classroom teacher. After observing the students' classroom participation during the first few weeks of the semester, teachers may suggest that certain students be tested. Often teacher judgment was relied on in addition to home language surveys or asking parents. In five of the schools it was tentatively assumed that children with Hispanic surnames might be limited-English-proficient and the school then used teacher judgment to confirm that the appropriate students were included in the group to be evaluated.

The major exception to the above procedures occurred in five schools in which the students were "assumed to be LEPs." These five schools were all located in one relatively small school district that was overwhelmingly Hispanic. The district policy is to provide a standard curriculum that employs academic instruction in both Spanish and English to all first graders. Only in subsequent years does the school face the problem of who is to be provided with special services because of limited English proficiency.

In all the schools with the exception of the five schools just discussed in which no evaluation or testing of first graders occurred, the standard procedure was to test all the students who might be LM-LEP with an English-proficiency test and to assign the student a LM-LEP classification based on a test score. As shown in Table 5.20, most of the schools used commercially available tests such as the Language Assessment Scale (LAS), The Language Assessment Battery (LAB), and Basic Inventory of Natural Language (BINL). In addition, a number of schools used locally developed tests.

One aspect of the classification process that seemed to vary considerably was the flexibility school administrators and teachers had in categorizing children as limited-English-proficient. At one extreme were schools in which the scores on the test were essentially the only factor taken into consideration. Any child who scored below the cut-off point then was automatically classified limited-English-proficient. At the other extreme were schools in which test scores were advisory rather than determinative. School administrators in conjunction with teachers, and sometimes in conjunction with special LM-LEP placement boards, could classify a child as LM-LEP or not, using their best judgment of the child's capabilities, regardless of test scores.

5H.2 INSTRUCTIONAL PROGRAMS AVAILABLE IN THE SCHOOL

After a child has been evaluated and determined to be limited-English-proficient, the school must face the problem of assigning the student to an appropriate classroom and program of study. Aside from the home language, English language abilities, and other educationally related student characteristics, two school-level features are of great importance: the types of programs available at the school and the overall demand for the special programs.

TABLE 5.19. Procedures used to identify potential LM-LEP students

	No. of Schools	Percentage
Home language survey only	40	54%
Home language survey and teacher judgment	12	16
School questions parents regarding language competencies of child	9	12
Hispanic surnames plus teacher judgment	5	7
School questions parents regarding language competencies of child plus teacher judgment	2	3
Teacher judgment only	1	1
No evaluation process (All given identical services)	5	7
Total	74	100%

TABLE 5.20. Tests used to determine language proficiency

Test Used	No. of Schools	Percentage
Language Assessment Scale	21	28%
Language Assessment Battery	13	17
Locally developed language assessment instrument	11	15
BINL	10	13
Language dominance test (unspecified)	6	8
Idea Oral Proficiency Test	4	5
Oral Language Development Test	3	4
LAS and Idea Oral Proficiency Test	2	3
No exam used	5	7
Total	75	100%

A child can only be assigned to the services that are available, and the schools in the study differed considerably in the services they provided. Detailed responses given to team leaders as part of the Programs and Procedures Interview made it possible to classify schools with regard to whether they provided for any of their first and third grade LM-LEP students: (1) an educational program that included academic instruction using the native language; (2) an educational program that used only the the English language for academic instruction and that included as well a special program of English instruction for LM-LEP students; or (3) both types of programs, but for different students. Further whether the services were available only to students of the predominant minority language at the school or whether they were available also to students from other minority language backgrounds was taken into consideration.

Tables 5.21 and 5.22 identify the basic options school administrators had when they assigned entering LM-LEP students to special services. Comparison of the two tables makes it clear that the kinds of instructional services available to the LM-LEP students who comprised the predominant language group at a school were significantly different from those available to the students from other language backgrounds. A great majority of the schools provided academic instruction using the native language for at least some of their LM-LEP students from the school's predominant language-minority group. The schools were far less likely, however, to provide such services for any of their students with native languages other than the predominant one.

For the students from the non-predominant language-minority background, academic instruction entirely in English with a special program in English instruction was most likely to be the single set of available instructional services. This difference suggests that in later outcome analyses it may be useful to compare LM-LEP students who had available to them both an instructional program using the native language and an all-English-medium special English program with those who did not. It may be that the lack of placement options at the school level prevented the proper placement of some students and adversely influenced their subsequent academic achievement.

TABLE 5.21. Program types available at study schools for predominant language-minority students

Programs Offered	No. of Schools	Percentage
1. An educational program that includes academic instruction using the native language	25	35%
2. An educational program with academic instruction entirely in English as well as a special program of English instruction for LM-LEP students	13	18
3. Both 1 and 2 above provided to different students	34	47
Total	72	100%

TABLE 5.22. Program types available at study schools for non-predominant language-minority students

Programs Offered	No. of Schools	Percentage
1. An educational program that includes academic instruction using the native language	10	14%
2. An educational program with academic instruction entirely in English as well as a special program of English instruction for LM-LEP students	23	33
3. Both 1 and 2 above provided to different students	6	9
4. No program for speakers of other than the predominant language minority group	30	43
Total	72	100%

5H.3 ASSIGNING LM-LEP STUDENTS TO SERVICES

Almost all schools have some formal way, usually through the use of English proficiency tests, of ascertaining the linguistic competencies of their students. Usually, too, schools have a stated policy for assigning students to services based on their scores on the various entry tests. For example, in one district the policy was that entering first-grade students who scored at or below a certain level on the district's English competency test were assigned to the instructional program that included academic instruction using the native language. Students who scored somewhat higher but below another cut-off were assigned to the special program of English instruction. Finally, students who scored above the higher cut-off were placed in mainstream English classrooms with no support services.

Usually these placement policies are devised with great care. Often second language development specialists, special district committees, and state or federal courts have an influence on their formation. However, in discussing the assignment and reassignment processes with school officials, team leaders often found that schools were following policies different from either the stated policies of the district or the stated policies of the school.

Of the 61 schools for which we are confident we know what the initial assignment process is, about half (31) can be said to be following the stated guidelines of the school and district. Children were evaluated, tested, and assigned to services following the school's publicly stated assignment procedures.

In 30 other schools, however, school officials were not able to follow the guidelines, usually because of a shortage of qualified teachers or a lack of classroom space. Most commonly, the shortages affected schools that provided academic instruction in the native language. In 23 of these 30 schools, school officials indicated in various ways that eligible students were admitted to such programs only if there was room. What follows are quotes from team leader interviews with administrators at three such schools:

> "The Spanish speakers with the least English go into bilingual classrooms; the others go into regular classrooms. If they had more bilingual teachers, they would have more kids in bilingual classrooms."

> "Usually A's (those who scored lowest on the district English competency test) go into self-contained bilingual classrooms; B's and C's (those who scored higher) receive pull-out bilingual instruction. However, the self-contained classrooms are over-enrolled and kids who might be put into them are put into other classrooms. Also, there is really not enough room in the pull-out bilingual program, either."

> "Sometimes there is an abundance of LEP students and services are provided to those with the biggest need as determined by test scores and teacher judgment."

Overall, providing a special program in English to all eligible LM-LEP students does not appear as difficult a problem as providing instruction using the native language. Nonetheless, 11 schools indicated that because of shortages they were unable to provide LEP children with the special English services they were eligible for under the stated guidelines. (This included 6 schools that also were unable to provide academic instruction using the native language to all those eligible under the stated guidelines.)

One team leader reported the following situation in a major urban school system:

> "There is a provision in the teacher's union contract that states that a teacher cannot provide instruction to more than 75 students during any week. In most schools there is only one ESL teacher assigned per building. Yet in every one of the studied schools there are more than 75 LEP students in each school. Therefore ESL pullout instruction is provided only to the LEP students who need it the most."

Another team leader reported that at least in one school the availability of teachers and classroom spaces seem to affect the LM-LEP classification process itself:

> "When sufficient space is unavailable in the ESL classes, students receive no special services. When finalizing the rosters for this study, the principal classified any such students as "former LEPs" even though some classroom teachers felt that at least some of these students were still LEPs. The principal's position was that only those being served were LEPs."

The above discussion of initial assignment procedures suggests that it will be worthwhile to examine the degree to which the inability of schools to provide the level of service they deem appropriate relates to the subsequent academic achievement of students attending such schools.

5H.4 REASSESSMENT

Another systematic selection issue arises some time after the initial assignment process, when it is necessary to decide whether to continue services or to transfer the child to a different set of services. Usually the reassessment occurs at the end of the school year when school administrators begin thinking about classroom assignments for the following year.

In the schools that provide academic instruction in the native language, two very different selection philosophies seemed to be operative. In some schools these native language programs are believed to be complete curricula of a fixed and pedagogically defensible duration. Students enter the program at some point, usually first grade or kindergarten, and continue in the program until it terminates, usually at the end of the third or fourth grade. Students continue without regard to their English abilities or test scores. They then exit to mainstream all-English classrooms, sometimes to all-English classes for the gifted and talented. However, if at the end of the program their English abilities are below some standard, they are usually provided with ESL or bilingual support services in addition to the mainstream all-English classroom instruction.

The alternative reassignment philosophy in programs that provide academic instruction using the native language is to view the programs as a temporary support, to be used only as long as necessary. A LM-LEP coordinator in a school which followed this approach explained his school's selection procedure as follows:

> "The school's philosophy is to place LEP students in an all-English-medium classroom as soon as possible. The evaluation as to when they are ready is mainly based on teacher evaluation. Bilingual instruction is usually terminated when the child can read one year below grade level."

The composition of the classrooms in which academic instruction using the native language is provided will vary greatly depending on which of the reassignment procedures is followed, especially by the third grade. If the operating assumption is that once you are in, you stay in until program termination, then the program will encompass students with a wide range of academic and oral English abilities. However, if students are removed from these classrooms as their English competencies approach those of native English speakers, then by the third grade the program will consist predominantly of students who either have difficulty learning English or have difficulty scoring well on tests designed to evaluate their English and academic abilities (or both).

In order to explore the consequences of these two pedagogical approaches, a school-level reassignment philosophy variable has been created for those schools that provide academic native language instruction. Thus it will be possible to examine the effect reassignment philosophy contributes to the efficacy of programs that utilize academic native language instruction.

5I I. SUMMARY

This chapter describes a series of school level variables which may potentially have an impact on the academic achievement of LM-LEP students in the Longitudinal Study. Although the data are presented at the school level, the relevant data will later be transferred onto individual student records. These school variables will then be available for use as control and predictor variables in outcome analyses.

The variables which are described fall into seven basic categories: (1) general characteristics of the school; (2) academic climate; (3) school language environment; (4) teacher training relevant to LM-LEP students; (5) principals' involvement in school affairs; (6) attitudes of the non-language-minority community; and (7) policies and practices relating to entry and exit from LM-LEP services. The results indicate that there is considerable diversity among schools on variables within each of these categories.

The analytic plan is to enter all of these variables into analyses to determine which are most strongly related to academic outcomes. Literature reviews and preliminary examination of variables suggest that special attention should be paid to the following variables in the analysis: (1) the percentage of the school's total enrollment who are LM-LEP students; (2) language use outside the classroom; (3) extensiveness of principals' interactions with teachers; and (4) the nature of exit criteria from special services for LM-LEP students.

CHAPTER 6

ELEMENTS OF INSTRUCTIONAL SERVICES

Chapter 6. ELEMENTS OF INSTRUCTIONAL SERVICES[1]

6A A. INTRODUCTION

In this study the nature of the instructional services provided to students is defined by seven categories of variables: the academic subjects taught; the amount of instruction in academic subjects; the language of instruction; the organization of instruction; the materials used for instruction; characteristics of the instructional staff; and characteristics of English language arts instruction.

The data for this chapter were drawn from two sources. Data on the subject taught, the amount of instruction, and the languages used for the instruction in each subject were drawn from the Instructional Language Record completed by each academic teacher. Data on teacher background characteristics and on other characteristics that define the nature of the instruction provided to students were drawn from the Instructional Staff Questionnaire.

For each student, the teacher who provided the largest proportion of academic instruction per week (and at least 12 hours of academic instruction per week) was designated as the "main academic teacher." The data provided by the main academic teacher in particular were considered to be important since these data represent the predominant characteristics of the instruction received by students.

For certain variables, however, it is also important to consider the contribution of other teachers of the student. Therefore, for certain analyses, the data were also examined in an aggregated form, in which the data from all academic teachers of an individual student have been combined to produce one composite value representing the total academic instruction provided to the student.

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[1] Abbreviations and other special terms used in this study are defined in the glossary, in Appendix A.

Finally, main and aggregated teachers were also identified separately for English language arts instruction and for mathematics instruction. This was done in order to be able to link teacher background characteristics with achievement in English language arts and mathematics in particular.

For 97 percent of the students, the main mathematics teacher was the same as the main academic teacher; for 94 percent of the students, the main English language arts teacher and the main academic teacher were the same. Thus, in general, the background and instructional characteristics reported for main academic teachers also represent the characteristics of main mathematics and main English language arts teachers.

In view of the importance of English language skills for the students in this study, some further discussion is presented regarding the instructional services provided in the subject. Data on the English language background and approach to English language arts instruction for the main English teacher and for all English language arts teachers are also described.

All data in this chapter refer to students rather than to teachers. Thus, percentages refer to the percentage of students to whom certain teacher attributes or organizational attributes apply rather than to the percentage of teachers themselves. Similarly when means are presented, they are means in which each student is entered once. To accomplish this, data for each teacher were treated as attributes of that teacher's students. In other words, it was assumed that the teacher's responses to questionnaire items were, in a sense, student characteristics because they described the kinds of instructional personnel and instructional procedures affecting the student.

It is important to understand that data in this chapter are to be regarded as descriptive of the Longitudinal Study sample--not as population estimates for the national population of LM-LEP students. The purpose of the data presented here is to provide background information which will be taken into account when subsequent analyses of a "relational" type are carried out.

6B

B. ACADEMIC SUBJECTS TAUGHT

Instructional services for elementary-level LM-LEP students may show some variation in the specific academic subjects taught. For example, instruction in native language reading and other native language arts may be included in some programs but not in others. When native language arts, including reading, are taught, it may be in addition to instruction in English reading and language arts. In other instances, however, native language reading may be taught earlier and English reading may be introduced at a later point in the program. Aside from differences in language arts instruction, some special instructional services that are focused on English development may be substituted for instruction in other academic subjects such as science and social studies.

As seen from the data in Table 6.1, 74 percent of the grade 1 LM-LEP students in the sample received instruction in reading in their native language; in comparison, 66 percent of LM-LEP students received native language reading instruction at grade 3. The difference in number of students receiving native language arts instruction was paralleled by a substantial difference in English reading instruction: about 25 percent more LM-LEP students at grade 3 relative to grade 1 received instruction in English reading. Almost all LM-LEP students received instruction in mathematics, science, and social studies--as was also true for the EP/LIS and EP/Comp students.

The students in the EP/LIS sample were distinguished in some ways from both the LM-LEP students and the EP/Comp students. EP/LIS students were more similar to EP/Comp students in terms of the proportion of students who received instruction in regular English reading and other language arts, in mathematics, and in social studies. A relatively small proportion of EP/LIS students in comparison to LM-LEP students received special instruction in English language arts; also EP/LIS students were less likely than LM-LEP students to be taught the language arts of a language other than English. However, EP/LIS students were about as likely as LM-LEP students to receive ethnic heritage instruction.

TABLE 6.1. Percentage of students in LM-LEP, EP/LIS and EP/Comp samples receiving instruction in specific academic subjects

	Grade 1			Grade 3		
Subjects:	LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
Regular English[a]						
Reading	55%	96%	100%	81%	98%	99%
Other[b]	66	98	99	84	98	99
Special English[a]						
Oral English	87	28	NA	76	29	NA
Reading and Other[b]	58	25	NA	62	27	NA
Native Language						
Reading	74	24	NA	66	25	NA
Other[b]	66	17	NA	52	22	NA
Mathematics	98	99	98	98	96	95
Science	96	97	97	97	97	98
Social Studies	96	99	97	97	99	98
Ethnic Heritage	68	59	26	66	70	23
No. of Students[c]	4947-5389	854-913	479-480	3732-4064	793-911	497-499

[a] "Regular English" refers to the English instruction provided to monolingual English-speaking students and other students who are proficient in English. "Special English" refers to an instructional program, such as ESL, that utilizes materials and methods especially designed for teaching English to LM-LEP students.

[b] "Other" refers to other language arts, i.e., language arts other than reading for regular English; language arts other than reading and oral English for special English instruction.

[c] A range of number of cases is provided, because the number of valid cases varies for different subject areas.

LM-LEP students from the three language groups (Spanish, Chinese, other) were differentially likely to receive instruction in several academic subjects. As shown in Table 6.2, grade 1 Chinese language and other language students were less likely to receive instruction in native language arts and more likely to receive regular instruction in English reading and other language arts, in comparison to the Spanish language students. At grade 3, however, an increased proportion of Spanish language students received regular English language arts instruction.

To some extent, Chinese language students were less likely to receive instruction in academic subjects other than language arts. At grade 1, in comparison to students in the Spanish language and other language groups, Chinese language students were less likely to receive science and social studies instruction. The Chinese language students were, however, more likely to receive ethnic heritage instruction. At grade 3 they are somewhat less likely to receive instruction in social studies and mathematics.

The data in Table 6.2 thus show that there were some important differences between the language groups in the proportion of students who received instruction in the various academic subjects. The differences may subsequently be related to differential levels of academic success for students from different language groups.

6C C. AMOUNT OF INSTRUCTION IN ACADEMIC SUBJECTS

Instructional services provided to different groups of students may include the same range of subject areas but may vary in the amount of time allotted to instruction in those subjects. This is an important factor in that much research has pointed to the significance for achievement outcomes of "time on task" or "engaged time," and of the amount of time spent in study of a particular subject (Fisher et al., 1978; Roshenshine & Berliner, 1978; Wiley & Harnischfeger, 1974).

TABLE 6.2. Percentage of LM-LEP students in Spanish, Chinese, and other language groups receiving instruction in specific academic subjects

	Grade 1			Grade 3		
	Spanish	Chinese	Other	Spanish	Chinese	Other
Subjects:						
Regular English[a]						
Reading	48%	82%	93%	79%	81%	97%
Other[b]	62	83	93	81	90	97
Special English[a]						
Oral English	88	88	75	76	77	70
Reading and Other[b]	58	61	57	63	40	60
Native Language						
Reading	81	68	25	71	66	30
Other[b]	72	45	28	54	66	25
Mathematics	99	89	98	98	89	99
Science	96	86	98	97	93	99
Social Studies	96	88	98	97	89	99
Ethnic Heritage	67	84	67	65	67	74
No. of Students[c]	4161-4554	207-213	578-662	3114-3387	200-216	416-461

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[a] "Regular English" refers to the English instruction provided to monolingual English-speaking students and other students who are proficient in English. "Special English" refers to an instructional program, such as ESL, that utilizes materials and methods especially designed for teaching English to LM-LEP students.

[b] "Other" refers to other language arts, i.e., language arts other than reading for regular English; language arts other than reading and oral English for special English instruction.

[c] A range of number of cases is provided, because the number of valid cases varies for different subject areas.

Table 6.3 presents the data on average number of hours per week of instruction in academic subjects for LM-LEP, EP/LIS, and EP/Comp students. In Table 6.4, the same data are presented for LM-LEP students by language group. When students did not receive instruction in a particular subject area, a value of zero hours was included in the group mean.

The data in Tables 6.3 and 6.4 indicate that at both grade levels, LM-LEP students (and especially Spanish language LM-LEP students) received more hours of academic instruction overall than did the English-proficient students. Although these differences may have been due to incomplete or inaccurate reporting by teachers, a more likely explanation is that LM-LEP students were receiving some of their special English instruction or native language instruction while their English-proficient peers were receiving art, music, physical education, or other types of instruction.

The three sample groups at both grade levels were very similar in the mean number of hours of instruction in mathematics and in science. This was also true for social studies instruction, with the exception of a higher mean for EP/Comp students at grade 3. However, differences between the sample groups are seen for English and native language arts instruction, and the pattern of means reflects the patterns found for the percentage of students receiving instruction. For example, Table 6.3 shows that grade 1 LM-LEP students received significantly less instruction in regular English language arts than the EP/LIS and EP/Comp students. For LM-LEP students there was a combined mean of about 5 hours per week of instruction in regular English (reading and other language arts) as contrasted with about 9 to 11 hours per week respectively for the other two groups. However, the difference in amount of English instruction between the groups is narrowed considerably if special instruction in English is also considered. The LM-LEP students received an average of about 3 hours of special instruction in oral English and about another hour of instruction in reading and other English language arts. A similar pattern for hours of instruction in regular and special English language arts is seen in the data for grade 3.

LM-LEP students on the average received more hours of instruction in native language arts than did EP/LIS students; this is more evident for

TABLE 6.3. Mean number of hours per week of instruction in all academic subjects for LM-LEP, EP/LIS, and EP/Comp students[a]

Subjects:	Grade 1			Grade 3		
	LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
Regular English[b]						
Reading	2.6	5.5	6.5	3.8	5.8	5.6
Other[c]	2.1	3.3	4.5	3.0	4.1	4.7
Regular English Total	(4.7)	(8.8)	(11.0)	(6.8)	(9.9)	(10.3)
Special English[b]						
Oral English	2.7	0.6	NA	1.9	0.5	NA
Reading and Other[c]	1.1	0.5	NA	1.4	0.6	NA
Special English Total	(3.8)	(1.1)	(NA)	(3.3)	(1.1)	(NA)
Native Language						
Reading	3.5	0.6	NA	2.4	1.1	NA
Other[c]	2.1	0.4	NA	1.3	0.5	NA
Native Language Total	(5.6)	(1.0)	(NA)	(3.7)	(1.6)	(NA)
Mathematics	4.3	4.2	4.2	4.5	4.3	4.4
Science	1.7	1.6	1.5	1.8	1.6	1.9
Social Studies	1.8	1.8	1.7	1.9	1.9	2.2
Ethnic Heritage	0.4	0.4	0.1	0.4	0.3	0.1
Total	(22.3)	(18.9)	(18.5)	(22.4)	(20.7)	(18.9)
No. of Students[d]	4787-5286	738-863	449-480	3624-3963	769-891	477-499

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[a] The means are based on all students for whom data were obtained; when students did not receive instruction in a particular subject area, a value of zero hours was included in the mean.

[b] "Regular English" refers to the English instruction provided to monolingual English-speaking students and other students who are proficient in English "Special English" refers to an instructional program, such as ESL, that utilizes materials and methods especially designed for teaching English to LM-LEP students.

[c] "Other" refer to other language arts, i.e., language arts other than reading for regular English; language arts other than reading and oral English for special English instruction.

[d] A range of number of cases is provided, because the number of valid cases varies for different subject areas.

TABLE 6.4. Mean number of hours per week of instruction in all academic subjects for Spanish, Chinese, and other language students[a]

Subjects:	Grade 1			Grade 3		
	Spanish	Chinese	Other	Spanish	Chinese	Other
Regular English[b]						
Reading	2.1	4.4	5.1	3.7	3.8	5.0
Other[c]	1.9	2.8	3.4	2.9	3.7	4.0
Regular English Total	(4.0)	(7.2)	(8.5)	(6.6)	(7.5)	(9.0)
Special English[b]						
Oral English	2.9	2.4	1.7	1.9	1.9	1.5
Reading and Other[c]	1.1	1.5	0.8	1.4	1.2	1.0
Special English Total	(4.0)	(3.9)	(2.5)	(3.3)	(3.1)	(2.5)
Native Language						
Reading	4.0	0.9	1.2	2.7	1.3	0.7
Other[c]	2.3	0.4	1.0	1.4	0.7	0.4
Native Language Total	(6.3)	(1.3)	(2.2)	(4.1)	(2.0)	(1.1)
Mathematics	4.4	4.0	4.1	4.5	3.9	4.3
Science	1.7	1.5	1.7	1.8	1.2	1.6
Social Studies	1.9	1.6	1.8	2.0	1.5	1.9
Ethnic Heritage	0.4	0.5	0.5	0.4	0.4	0.6
Total	(22.7)	(20.0)	(21.3)	(22.7)	(19.6)	(21.0)
No. of Students[d]	4054-4461	182-212	551-631	3033-3306	188-208	403-456

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[a] The means are based on all students for whom data were obtained; when students did not receive instruction in a particular subject area, a value of zero hours was included in the mean.

[b] "Regular English" refers to the English instruction provided to monolingual English-speaking students and other students who are proficient in English "Special English" refers to an instructional program, such as ESL, that utilizes materials and methods especially designed for teaching English to LM-LEP students.

[c] "Other" refer to other language arts, i.e., language arts other than reading for regular English; language arts other than reading and oral English for special English instruction.

[d] A range of number of cases is provided, because the number of valid cases varies for different subject areas.

grade 1 than for grade 3. In Table 6.3, the combined means at grade 1 for native language arts (reading and other) are about 6 hours per week for LM-LEP students and only about 1 hour per week for EP/LIS students.

For LM-LEP students, differences were found across the Spanish, Chinese, and other language groups. Chinese and other language students received more instruction in regular English language arts than Spanish language students, and received less instruction in special English language arts. Students in the other language group came closest to the mean number of hours of instruction found for English-proficient students, particularly at grade 3; they received a total of 8.5 hours of regular English at grade 1 and 9 hours at grade 3. These students also received the least instruction in special English.

Spanish language students received substantially more instruction per week in native language arts than students in the other language groups. Spanish language students also tended to receive somewhat more instruction in mathematics, science, and social studies than did Chinese and other language students, and also more than EP/LIS and EP/Comp students.

In summary the data on mean hours per week of academic instruction indicate that there were differences in the mean number of hours of instruction in individual subject areas not only for LM-LEP versus English-proficient students but also among the three LM-LEP student language groups. Such differences, particularly if maintained through the next years of schooling, may affect the students' level of academic success in those subjects.

6D

D. LANGUAGE OF INSTRUCTION

A most significant factor in instruction of LM-LEP students is the language that is used in providing academic instruction. Very different approaches exist, ranging from those in which only English is used to those in which all or almost all instruction is presented through the use of the native language; in between these two alternatives are approaches that use all possible ratios of the two languages for instruction (Young et al., 1984).

6.D1 USE OF ENGLISH FOR INSTRUCTION

The amount of native language versus English language use in instruction generally will vary from subject to subject. Table 6.5 presents the average, across students, of the percentage of English use for instruction in the various subject areas; these data are presented for the large language groups in each grade.

For all groups, both regular English instruction and special English instruction included very high levels of English language use; the means indicate that there was about 5 to 10 percent use of the students' native language in these subjects, presumably for explanation and clarification of instruction. For other academic subjects, the means at both grades reflect a level of native language use consistent with its use for some primary instruction--i.e., the native language was used not only as a support for English language instruction but also as a means of presenting new facts and concepts.

The means for the other language students showed the highest levels of English language use for mathematics, science, social studies, and ethnic heritage instruction. The lowest levels of English language use in these subjects were found for the Spanish language students; however, even for this group the means were all above 50 percent.

The mean levels of English language use for English language arts instruction (both regular and special instruction) were high for both grades. For the non-language academic subjects, the level of English language use for instruction was higher for grade 3 students than for grade 1 students.

TABLE 6.5. Mean percentage of use of English for instruction of LM-LEP students in academic subjects[a]

	Grade 1			Grade 3		
Subjects:	Spanish	Chinese	Other	Spanish	Chinese	Other
Regular English[b]						
Reading	95%	88%	93%	95%	90%	94%
Other[c]	90	87	92	93	87	93
Special English[b]						
Oral English	93	92	94	94	94	91
Reading and Other[c]	91	88	93	94	88	89
Mathematics	61	71	86	78	80	87
Science	59	69	86	75	79	87
Social Studies	58	67	84	75	78	84
Ethnic Heritage	53	59	63	69	65	71
No. of Students[d]	1878-4416	125-188	302-598	1829-3252	72-179	239-449

[a] The percentage of English language use is based on the average percentage of English language use reported over the fall, winter, and spring data collection periods.

[b] "Regular English" refers to the English instruction provided to monolingual English-speaking students and other students who are proficient in English. "Special English" refers to an instructional program, such as ESL, that utilizes materials and methods especially designed for teaching English to LM-LEP students.

[c] "Other" refers to other language arts, i.e., language arts other than reading for regular English; language arts other than reading and oral English for special English instruction.

[d] A range of number of students is provided, since the number of valid cases varies by subject area. The mean percentage for each subject is based on data for those students who receive instruction in the relevant subject; therefore, the range of numbers of students is broader in this table than in Tables 6.1-6.4.

6D.2 USE OF SIMPLIFIED ENGLISH

In completing the Instructional Language Record, teachers indicated whether the English they used in teaching was primarily a simplified form of English or regular English (not modified for LM-LEP students). "Simplified English" was defined as the deliberate simplification of vocabulary and sentence structure so that the English used is more easily comprehended by a language-minority limited-English-proficient child. For LM-LEP students, the use of simplified English is expected to facilitate acquisition of both English and content area knowledge (Krashen, 1982; Krashen & Terrell, 1983). This variable is a major component in the definition of service clusters, discussed in Chapter 7.

In Table 6.6, data are presented on the use of simplified English for LM-LEP students from the Spanish, Chinese, and other language groups. The data are from the winter data collection only.[1]

The data show that Spanish language students were more likely than Chinese and other language students to receive simplified English for instruction that was presented in English. This pattern was found at both grades 1 and 3. The data also show that Chinese language students were more likely to receive simplified English in grade 1 than in grade 3.

At both grades, a greater proportion of Chinese language students received simplified English for non-language arts academic instruction than they did for English language arts instruction. In contrast, the Spanish language and other language students were about equally likely to receive simplified English instruction in both types of subject areas.

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[1] As a result of changes in wording and structure of the Instructional Language Record, the data on simplified English obtained during the fall data collection were not consistent with the data obtained during the winter and the spring data collection periods. Since there may be a shift toward decrease in use of simplified English over the course of the school year, the winter data collection period was selected as more representative than the spring data for this analysis.

TABLE 6.6. Percentage of LM-LEP students who received primarily simplified English when English was used for instruction

	Non-language Arts Academic Instruction		English Language Arts Instruction	
	Percentage of Students	No. of Students	Percentage of Students	No. of Students
Grade 1				
LM-LEP:				
Spanish	43%	3,404	44%	3,641
Chinese	22	157	12	179
Other	27	524	26	546
LM-LEP Overall	40	4,085	41	4,366
Grade 3				
LM-LEP:				
Spanish	40%	2,598	37%	2,638
Chinese	32	155	23	177
Other	18	401	20	400
LM-LEP Overall	37	3,154	34	3,215

6E E. INSTRUCTIONAL ORGANIZATION

The nature of instructional services can be further defined by factors relating to the organization of the instructional services provided to LM-LEP students. These are factors such as the number of instructional staff who work with the individual student, and the extent to which students are in classrooms with various types of organization patterns for instruction.

6E.1 NUMBER OF INSTRUCTIONAL STAFF

A first indication of the nature of the organization of instructional services is the number of teachers responsible for the instruction of an individual student. One teacher per student indicates that instruction is in a self-contained classroom, while more than one teacher per student may indicate that some pull-out instruction is provided or that there is a team teaching situation. Whenever two or more teachers are involved in providing instruction to a student, there is a potential for some disruption or conflict in the student's instruction, and thus coordination among teachers becomes important.

In Table 6.7 data are presented concerning the number of different teachers who instruct individual students. Among the three sample groups, LM-LEP, EP/LIS, and EP/Comp, there were few differences (except for a small trend at grade 1 of fewer teachers per student for EP/LIS students). However, there were clear differences among the three language groups within the LM-LEP sample. At both grade 1 and grade 3, there was a higher mean for the other language students than for the Spanish and Chinese language students. These data suggest that other language students were much more likely to receive instruction in a pull-out situation, and that Chinese language students were the least likely of the LM-LEP students to receive instruction from more than one teacher.

TABLE 6.7. Mean number of academic teachers by whom individual students were instructed in the course of a week*

	Number of Teachers	No. of Students
Grade 1		
LM-LEP:		
Spanish	1.3	4,532
Chinese	1.1	213
Other	1.8	622
LM-LEP Overall	1.4	5,367
EP/LIS	1.2	909
EP/Comp	1.4	479
Grade 3		
LM-LEP:		
Spanish	1.4	3,371
Chinese	1.3	208
Other	1.9	459
LM-LEP Overall	1.4	4,038
EP/LIS	1.3	844
EP/Comp	1.4	497

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*These means were based on the number of teachers who reported instructing the student in academic subjects in the fall, winter, and spring data collection periods.

6E.2 USE OF AIDES OR VOLUNTEERS

Teachers frequently receive assistance in the classroom from aides or volunteers who carry out a range of activities. In the case of teachers with LM-LEP students in their class, aides and volunteers may provide: (1) information on the students' cultures, (2) native language assistance to the student, and (3) some content area instruction to the student in the native language. When an aide or volunteer is present in the classroom, the teacher may be able to devote more time to individual or small group instruction (Wiley & Harnischfeger, 1974), and may be more flexible in planning classroom instructional activities.

As shown in Table 6.8, a substantially larger percentage of students in the LM-LEP and EP/LIS groups had teachers who were assisted by aides compared to students in the EP/Comp group. Use of volunteers was substantially lower than use of aides for all of the groups.

There was also variation among the three LM-LEP language groups in the use of aides and volunteers. Main teachers of other language students reported use of an aide less frequently than did main teachers of Spanish and Chinese language students. For all three language groups at both grade levels, the percentages indicate that use of aides in the LM-LEP students' classes was common; this was also true for EP/LIS students' classes, particularly at grade 1.

The data on use of volunteers demonstrates an interesting pattern of differences that can perhaps be related to differences in parent and background characteristics. Chinese language students were far more likely to be in classes in which volunteers assisted the teacher than were Spanish and other language students. This may reflect a higher level of parent and community involvement in the schools and in the students' education for the Chinese language students than for the Spanish and other language students.

TABLE 6.8. Percentage of students whose main academic teachers reported the use of aides or volunteers

	Use of Aide		Use of Volunteer	
	Percentage of Students	No. of Students	Percentage of Students	No. of Students
Grade 1				
LM-LEP:				
Spanish	83%	4,120	14%	4,131
Chinese	89	195	28	195
Other	56	540	14	540
LM-LEP Overall	80	4,855	15	4,866
EP/LIS	96	721	18	721
EP/Comp	65	360	16	360
Grade 3				
LM-LEP:				
Spanish	68%	3,081	11%	3,076
Chinese	88	195	40	195
Other	63	430	11	429
LM-LEP Overall	69	3,706	12	3,700
EP/LIS	74	801	8	782
EP/Comp	43	353	7	352

The mean number of hours per week that aides and volunteers were reported to work with LM-LEP students for each of the three language groups are presented in Table 6.9. The highest mean number of hours was for aides in the Chinese students' classes. The mean number of hours that volunteers worked with LM-LEP students in these students' classes was very low--about one hour per week--at grade 1, and even lower at grade 3.

6E.3 ORGANIZATION OF THE CLASSROOM FOR INSTRUCTION

Studies of academic achievement of language minority students have indicated that the organization of the classroom for instruction may affect students' success. For example, research has indicated that for some LM-LEP students, instruction in small groups is related to higher levels of academic achievement than instruction presented to the class as a whole (Gallimore, 1981; Lucker et al., 1976). For other students, however, the opposite may be the case (Fillmore, 1985).

TABLE 6.9. Mean number of hours per week that LM-LEP students were in classes in which aides or volunteers assisted in their instruction

	Aide		Volunteer	
	Mean Hours	No. of Students	Mean Hours for Volunteer	No. of Students
Grade 1				
Spanish	10.1	4,047	1.1	4,087
Chinese	16.3	195	1.0	195
Other	4.4	534	0.8	526
Grade 3				
Spanish	7.4	3,036	0.4	3,057
Chinese	10.4	193	0.7	195
Other	5.0	378	0.5	429

While there may be variation from subject to subject in the types of classroom organizations used, teachers differ in the types of instructional situations that they prefer overall. In the Instructional Staff Questionnaire, teachers were asked to indicate the percentages of time that they spent in each of four types of classroom instructional organizations: whole class, small group, individual instruction, and student independent work.

Table 6.10 presents data with regard to the classroom organizational patterns used for instruction. At grade 1, EP/Comp students' main teachers reported a high mean use of whole class instruction and less use of group, individual, or independent work instructional situations. On the other hand, LM-LEP students' teachers overall reported about equal means for use of whole class and group instructional situations. Some variation was present in the data for the LM-LEP students in the three language groups. The data for the Chinese language students had a pattern of means that was closer to that of the EP/Comp students. Chinese students' teachers reported a somewhat higher mean percentage use of whole class instruction relative to group instruction. This finding is consistent with Fillmore's (1985) research which suggests that Chinese students do best within whole class instructional situations. There was also a lower mean reported by main teachers of Chinese language students for use of independent work relative to the other two language groups. Grade 1 Chinese language students were also more likely than any other students (LM-LEP and English-proficient students) to be instructed within individual instruction situations (although this was not true for grade 3 students).

At grade 3, the mean percentage use of whole class instruction for EP/Comp students was higher than for group instruction; however, both of these percentages were lower for grade 3 than for grade 1. Independent work was used more for grade 3 students than grade 1 students. For grade 3 LM-LEP students, the means for whole class and group instruction were very similar to those for grade 1 for both Spanish and Chinese language students.

TABLE 6.10. Mean percentage use of specific classroom organizations during instruction by main academic teachers

	Whole Class	Small Group	Individual Instruction	Independent Work	No. of Students
Grade 1					
LM-LEP:					
Spanish	35.8	34.8	13.4	16.5	3,874
Chinese	38.3	33.0	16.7	12.0	193
Other	33.8	34.3	13.4	18.6	502
LM-LEP Overall	35.7	34.6	13.5	16.5	4,569
EP/LIS	34.2	36.9	13.2	15.8	681
EP/Comp	42.5	29.6	14.1	13.8	337
Grade 3					
LM-LEP:					
Spanish	34.5	33.4	13.1	19.0	2,869
Chinese	35.0	31.5	13.5	20.0	187
Other	39.4	29.2	14.9	16.5	406
LM-LEP Overall	35.1	32.8	13.4	18.8	3,562
EP/LIS	32.5	36.2	12.7	18.7	732
EP/Comp	38.2	26.3	15.4	20.2	345

6F F. CLASSROOM MATERIALS USED FOR INSTRUCTION

The types of instructional materials used in the classroom are important, because teachers depend substantially in their instruction upon the particular reader, textbook, student workbook, etc., selected for use (Duffy & McIntyre, 1982; Durkin, 1981; Freeman et al., 1983). Whether the materials are relevant to the LM-LEP students' own culture and experience may be particularly important. There are two ways in which materials may be related to LM-LEP students' experience: the materials may be in LM-LEP students' own native language, and they may incorporate aspects of the students' cultural knowledge and experience.

Also important may be the extent to which the materials used are coordinated between the LM-LEP curriculum and the curriculum received by English-proficient students. When there is such coordination of materials, transition from special services to a regular classroom is expected to be much easier for the LM-LEP student.

6F.1 THE USE OF NATIVE LANGUAGE MATERIALS

For LM-LEP students, the use of native language materials provides an exposure to academic content without the language limitations imposed when material is presented in English. As shown in Table 6.11, the use of native language materials varied by language group. Spanish language students were more likely than Chinese and other language students to be in classes where native language materials were used, either alone or in combination with English language materials. The percentages of students whose main teachers reported the use of at least some native language materials for the Spanish, Chinese, and other language groups were, respectively: 67, 32, and 16 percent at grade 1, and 58, 35, and 23 percent at grade 3. Use of *only* native language materials indicated for the three groups were, respectively: 26, 12, and 2 percent at grade 1, and 11, 7 and 2 percent at grade 3. Thus, Spanish language students were particularly likely to be taught with native language materials, especially in grade 1.

TABLE 6.11. Percentage of LM-LEP students whose main teachers reported the use of specific types of materials

	Grade 1			Grade 3		
	Spanish	Chinese	Other	Spanish	Chinese	Other
Single Type of Materials:						
1. LM-LEP and EP materials are the same	24%	54%	69%	31%	52%	57%
2. Native-language versions of EP materials	5	12	1	5	7	2
3. English materials designed for LM-LEPs, different from EP materials	6	1	1	4	4	12
4. Native-language materials different from EP materials	15	0	1	3	0	0
More than One Type of Materials:						
5. LM-LEP same as EP and English materials designed for LM-LEPs	3	13	13	8	9	9
6. LM-LEP same as EP and any native language materials	20	13	12	23	1	5
7. English materials designed for LM-LEPs and any native language materials	12	5	0	10	15	8
8. Native language materials: related to EP materials and not related	6	0	0	3	0	0
9. English materials same as EP, and different from EP, and any native language materials	9	2	2	14	12	8
Total	100%	100%	100%	100%	100%	100%
No. of students:	3994	195	524	2998	180	422

6F.2 USE OF ENGLISH LANGUAGE MATERIALS DESIGNED FOR LM-LEP STUDENTS

It is sometimes argued that it is difficult for LM-LEP students to use regular curriculum materials, not only due to language limitations, but also because of a lack of the mainstream cultural knowledge and experience that is assumed in those materials (Ching, 1976). For these reasons, materials have been designed for use with LM-LEP students that take into consideration their special needs. These materials use a level of English the authors judge to be appropriate to the LM-LEP students' abilities and incorporate language-minority students' experiences into the content of the materials.

Of the LM-LEP students overall, 28 percent in the grade 1 cohort and 36 percent in the grade 3 cohort had main teachers who reported the use of English-language materials designed specifically for non-native speakers of English. About 5 percent in each cohort had main academic teachers who reported the use of this type of English language material only. At grade 1, these were primarily Spanish language students, but at grade 3 the use of specially designed English materials only was reported by main teachers for about 4 percent of the Spanish language and the Chinese language students, and for about 12 percent of the other language students. A larger proportion of the students were exposed to at least some use of specially designed English language materials: 30 percent of the grade 1 Spanish language students were in academic classes using these materials for at least some instruction, compared to 21 and 16 percent of Chinese and other students. For grade 3 students, 36, 40, and 37 percent respectively of the Spanish, Chinese and other language students were exposed to use of these materials in their classes.

6F.3 RELATIONSHIP BETWEEN LM-LEP AND EP/COMP INSTRUCTIONAL MATERIALS

When there is some coordination between the curricular materials used by LM-LEP students and those used by English-proficient students, the transition to a mainstream classroom is expected to be much smoother for the exited LM-LEP student. If there is coordination of materials, the knowledge and skills acquired by the LM-LEP students during their participation in special services will match those of students in regular classrooms.

Use of only English language materials that are the same as those used with English proficient students or of native language versions of those materials was reported more by main teachers of Chinese and other language students than by main teachers of Spanish language students. Overall, for about three-quarters of the students at grade 1 and for about 90 percent at grade 3, the students' main teacher reported use of materials related to those used by English-proficient students, either materials that were the same as those used by the English-proficient students or materials that were native language versions of those used by English-proficient students. Thus, most students are in classes where at least some of the materials are related to those used by the mainstream students in their school.

6G G. CHARACTERISTICS OF THE INSTRUCTIONAL STAFF

Of at least equal importance with the content and structure of instruction are the characteristics of the persons providing that instruction. In this study, certain background characteristics of teachers of the sample students were obtained in the Instructional Staff Questionnaire. The variables included training and experience in teaching, certification, education, language background, and philosophy regarding the teaching of LM-LEP students. The data on background characteristics are presented for the main academic teachers of the students. "Main academic teacher" refers to that teacher who instructs the student in academic subjects (language arts, math, science, social studies) for the greatest proportion of time and for at least 12 hours per week.

6G.1 LEVEL OF HIGHER EDUCATION

Teachers with more education generally demonstrate higher levels of clarity in presentation of new material (Rosenshine & Furst, 1971), a necessary component of effective instruction, and can be expected to have other skills and knowledge important for student academic success. For this study, the highest degree earned by teachers was scaled as follows: 1 = associate degree; 2 = bachelor's degree; 3 = master's degree; 4 = doctoral degree. The mean levels of higher education for main academic teachers of students were for the most part consistent across all of the study groups at both grade levels. The means ranged from 2.3 to 2.5, indicating that students were generally taught by teachers who had earned at least a bachelor's degree and who may also have taken a postgraduate degree.

6G.2 CERTIFICATION

In considering the certification of teachers, two questions are relevant: First, do the teachers of the students in the various groups hold state credentials or university certificates to teach? Second, are the credentials/certificates held by the teachers in this study within areas that are of relevance to the student groups they are instructing?

Essentially all of the main academic teachers (99 percent) held teaching certificates or state credentials. Table 6.12 presents the percentage of LM-LEP students whose teachers reported holding credentials in either of two areas specifically related to the teaching of LM-LEP students: (1) bilingual education and (2) English as a second language (ESL). These data are presented both for main academic teachers and aggregated across teachers. The aggregated data indicate the percentage of students for whom at least one teacher reported credentials in bilingual education or ESL.

The data show that 46 percent of the first-grade students and 51 percent of the third-grade students had main teachers with credentials in bilingual education or in English as a second language. Also, 54 percent of first-grade students and 61 percent of the third-grade students had at least one teacher who held such credentials. The proportion of students with a main teacher credentialed in these areas was highest for the Spanish language students.

6G.3 COLLEGE COURSEWORK AND INSERVICE/PRESERVICE

Instruction of language-minority students is generally found to be more effective when it is presented by a person who is familiar with the student's cultural background (Au & Mason, 1981; Van Ness, 1981). The students' teachers indicated areas in which they had taken college-level courses or within the past three years had received in-service or

TABLE 6.12. Percentage of LM-LEP students whose teachers reported credentials in bilingual education/ESL

	Main Teacher with Credentials	No. of Students	Any Teacher with Credentials	No. of Students
Grade 1				
LM-LEP:				
Spanish	49%	4,089	60%	4,428
Chinese	36	195	61	200
Other	28	521	38	596
LM-LEP Overall	46	4,805	54	5,224
Grade 3				
LM-LEP:				
Spanish	55%	3,062	63%	3,330
Chinese	42	195	44	206
Other	31	430	51	458
LM-LEP Overall	51	3,687	61	3,994

pre-service training sessions related to the academic instruction of LM-LEP students. These areas included the following: teaching the native language arts of LM-LEP students; teaching math, science, social studies in LM-LEP students' native language; teaching history, culture, or ethnic studies associated with the background of LM-LEP students; teaching English as a second language (ESL), and teaching math, science, or social studies in English to LM-LEP students.

Table 6.13 presents data on the percentage of LM-LEP students by language group whose teachers reported having taken courses or received recent in-service or pre-service training related to the academic instruction of LM-LEP students. Overall more than 60 percent of the

TABLE 6.13. Percentage of LM-LEP students whose main academic teachers have taken college coursework, in-service/pre-service related to academic instruction of LM-LEP students

	Percentage of students whose main academic teacher reported:		
	College Coursework[a]	Recent In-service or Pre-service Training[a,b]	No. of Students
Grade 1			
Spanish	67%	50%	4,131
Chinese	37	62	195
Other	48	48	540
Grade 1 Overall	64	50	4,866
Grade 3			
Spanish	65%	67%	3,082
Chinese	58	58	195
Other	41	41	430
Grade 3 Overall	61	63	3,707

[a] The areas of coursework and in-service or pre-service training reported by teachers that are related to academic instruction of LM-LEP students are: teaching math, science or social studies in the native language to LM-LEP students; teaching history, culture, or ethnic studies associated with the background of LM-LEP students; teaching English as a second language (ESL); teaching the language arts of the native language to LM-LEP students; teaching math, science, or social studies in English to LM-LEP students.

[b] The percentages for pre-service or in-service training reflect the percentage of students whose teachers reported receiving recent training in those areas, i.e., training within the past three years only.

students had teachers who reported having taken college coursework relevant to the instruction of LM-LEP students, and over 50 percent had teachers who reported in-service or pre-service training. Some differences did exist by language groups and by cohort, however. In the grade 1 cohort, more teachers of Spanish language students had college coursework than had received recent in-service or pre-service training; the reverse of this pattern was found for the teachers of Chinese language students, who were less likely to have taken college coursework but were more likely to have received recent in-service or pre-service training. These data are consistent with the data reported earlier in this section showing that Spanish language students' teachers were more likely to have credentials in bilingual education or in English as a second language.

In the grade 3 cohort, students were equally likely to have a teacher who had either taken college coursework or received pre-service or in-service training relevant to LM-LEP students. These percentages, like those for the grade 1 cohort, are not consistent across the three language groups. More teachers of Spanish language students reported such coursework or training than did teachers of Chinese language students; however, teachers of Chinese language students were more likely to have coursework or training than were the teachers of the other language students.

6G.4 TEACHING EXPERIENCE

Teachers with more experience in the classroom are likely to be better classroom managers, which is an important prerequisite to effective instruction (Brophy, 1979; Brophy & Evertson, 1976). The instructional staff who worked with the students in the study had from 1 year to as many as 41 years of experience in teaching at the elementary grade level (K-6). Teachers ranged in experience in working with LM-LEP students in kindergarten through grade 6 from 1 to 31 years.

In Table 6.14, data on the teaching experience of main academic teachers are presented. At both grade levels, EP/Comp students were taught by more experienced teachers, on the average, than other groups of students. Also at both grade levels, Spanish language students had the least experienced main teachers.

TABLE 6.14. Years of experience reported by students' main academic teachers

	Years Teaching Elementary Grades		Years Teaching Elementary Grade LM-LEP Students	
	Mean	No. of Students	Mean	No. of Students
Grade 1				
LM-LEP:				
Spanish	9.7	4,117	7.1	4,062
Chinese	11.3	195	8.7	188
Other	12.9	512	7.5	506
Overall LM-LEP	10.1	4,824	7.2	4,756
EP/LIS	9.6	721	7.5	708
EP/Comp	15.3	362	NA	NA
Grade 3				
LM-LEP:				
Spanish	9.6	3,076	6.9	3,008
Chinese	14.1	172	9.2	170
Other	14.3	425	9.0	388
Overall LM-LEP	10.3	3,673	7.2	3,566
EP/LIS	11.4	778	8.4	712
EP/Comp	14.3	347	NA	NA

With regard to their teachers' experience in teaching LM-LEP students in particular, the differences among student groups varied somewhat from those seen for all elementary-level teaching experience. At grade 1, there were relatively small differences among sample groups. Teachers of grade 3 Spanish language students reported the least experience in teaching LM-LEP students of any of the groups of LM-LEP students.

6G.5 SUPPORT FOR USE OF THE NATIVE LANGUAGE IN INSTRUCTION

In Chapter 5, a composite variable is described which indicated the principal's degree of support for use of the students' native language in instruction. Teachers responded to these same statements in the Instructional Staff Questionnaire and the same composite measure of support for use of the native language in instruction was obtained. The mean ratings on this composite are presented in Table 6.15. As the data show, teachers of LM-LEP students expressed more support for use of the native language than did teachers of English-proficient students. Main teachers of Spanish language students expressed more support than did main teachers of Chinese language and other language students.

6G.6 LANGUAGE BACKGROUND OF THE INSTRUCTIONAL STAFF

It is important in this study to be aware of the language background of the instructional staff both in English and in the student's native language. In order to be effective teachers of English to LM-LEP students and to provide an adequate language model for students, teachers must have an adequate level of ability in English. Knowledge of the LM-LEP student's language can be important in at least two ways. First, even if the language is not used in the classroom instruction, background in the language will help the teacher to understand language errors that the student makes. Second, a teacher who is able to use both English and the student's native language provides a valuable role model for the student that may promote language acquisition and academic achievement in indirect ways.

TABLE 6.15. Support for use of the native language in instruction by students' main academic teachers*

Grade 1	Mean rating*	No. of Students
LM-LEP:		
Spanish	3.6	4,109
Chinese	3.3	195
Other	3.0	526
LM-LEP Overall	3.5	4,830
EP/LIS	3.2	720
EP/Comp	3.0	357
Grade 3		
LM-LEP:		
Spanish	3.5	3,038
Chinese	3.1	195
Other	3.1	430
LM-LEP Overall	3.4	3,663
EP/LIS	3.3	801
EP/Comp	2.7	336

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*The mean rating of support for use of the native language was based on teachers' ratings of agreement with several statements regarding the use of the native language in academic situations.

Teachers were asked to describe the kind of experience they had both in use of English and in use of the language other than English with which they were most familiar (if any). They described their experience in each language by indicating whether the language was: (1) their native language, (2) a language used extensively since childhood, (3) the language of instruction for elementary or secondary education, (4) the language of instruction for college and university studies, (5) studied as a foreign language in school.

From the responses, two measures of language background were constructed for each teacher: (1) background in English, and (2) background in the student's native language. The measures were created by summing across the responses of the teacher, after assigning a value of 1 to each of the "yes" responses to the item. By summing response values, for example, a value of 4 for background in English would be assigned to a teacher who indicated that English was his/her native language, had used English extensively since childhood, and for whom English was the language of instruction for elementary, secondary, and also college education. A non-native speaker of English who received college instruction in English and who studied English as a foreign language would receive a value of 2 on English language background.

The definition of the native language background of the teachers was always in reference to the native language of the individual student. That is, an individual student's teacher was scored as being a bilingual only in cases where there was a match between the student's native language and the non-English language (if any) of the teacher. Thus, a teacher who speaks both English and Spanish was scored as a speaker of the student's native language for the Spanish language students, but not as a speaker of the student's native language for Chinese language students.

As a first approach to examining the language background of students' main teachers, a composite variable was created to indicate the type of bilingual background possessed by the teachers. (This same bilingual background composite was also used in the analysis of the data for school principals). Each teacher was classified into one of the following categories:

- Background in English, but not the student's native language;
- Background in the student's native language, but not English;
- Background in English with formal study (only) of student's native language;
- Background in the student's native language with formal study (only) of English;
- Bilingual through experience beyond formal study only; and
- Other: cases which do not fit the above.

The results of the categorizations of the main academic teachers of LM-LEP students are presented in Table 6.16. Spanish language students frequently had teachers who had backgrounds in both English and Spanish. About 22 percent of the Spanish students had teachers who were English speakers and who were familiar with Spanish through formal study of the language alone. Only 4 percent of Chinese language students had teachers who were bilingual in this way. Most of the teachers of Chinese language students who were bilingual had background in Chinese through home experience and/or educational experience in Chinese and not through formal study alone.

The LM-LEP students with native languages other than Spanish or Chinese were most often taught by teachers with backgrounds in English but not in the student's native language. The highest proportion of "other" category cases (cases which did not fit any of the first five categories of bilingual language background) occurred for this group of students. This category included persons who, for example, were native speakers of Spanish with limited background in English but who were teaching an Arabic speaking student.

TABLE 6.16. Bilingual categorizations of LM-LEP students' main academic teachers

	Grade 1			Grade 3		
	Spanish	Chinese	Other	Spanish	Chinese	Other
Grade 1						
Background in English, but not in the student's native language	22%	31%	62%	20%	45%	64%
Background in student's native language, but not in English	0	0	0	0	0	0
Background in English with formal study only of student's native language	22	4	1	25	4	0
Background in student's native language with formal study only of English	3	0	1	2	0	0
Bilingual through experience in the language other than formal study	52	60	19	50	44	23
Other	2	5	19	3	8	13
Total	100%	100%	100%	100%	100%	100%
No. of Students	3982	187	525	2927	194	430

The results of the separate analyses of LM-LEP students' main academic teachers' language background in English and in the students' native language are presented in Table 6.17. The data indicate that students typically were taught by main academic teachers who had a higher mean rating for English language background than for background in the students' native language. The difference between language background scores was greatest for teachers of other language students. Teachers of Chinese language students were found to have the lowest mean English background score.

Students may be taught by more than one teacher. In some cases, their main teachers may be monolingual, but one or more of the other teachers who instruct these students may be bilingual. Results of the language data were therefore analyzed a second time, using the data of all academic teachers of individual students. For these analyses, a mean teacher language proficiency score was obtained as a composite teacher language proficiency value for each student; the results of the analyses based on the aggregated data for LM-LEP students are presented in Table 6.18. These data show patterns similar to those found in Table 6.17.

The overall level of the means indicate that on the average the students were taught primarily by teachers who have had considerable experience with English. The overall mean for background in the students' native languages was much lower, and indicates that in general, the students were not likely to be taught by teachers with an extensive background in the students' native languages.

As an additional measure of teacher proficiency in English, all academic teachers were rated on oral proficiency in English by the study team leader at each site (all of whom were proficient speakers of English). These ratings were done on the SOPR form, the same rating form that was used by the teachers in rating the students' oral proficiency.

Overall, it was found that the majority of teachers were quite proficient in English; in all but two of the districts, at least 90 percent of the teachers received a total score of 23 or above (with 25 representing native speaker level of proficiency). Only about 1 percent of the teachers

TABLE 6.17. LM-LEP students' main academic teachers: Mean rating of background in use of English and in use of the student's native language

	English		Students' native language	
	Mean*	No. of Students	Mean*	No. of Students
Grade 1				
LM-LEP:				
Spanish	3.1	4,088	1.6	4,000
Chinese	2.9	187	1.4	195
Other	3.2	525	0.5	540
LM-LEP Overall	3.1	4,800	1.5	4,735
Grade 3				
LM-LEP:				
Spanish	3.2	3,060	1.5	2,949
Chinese	3.1	194	1.2	195
Other	3.3	430	0.7	430
LM-LEP Overall	3.2	3,684	1.4	3,574

*The rating of background in use of each language is based on the sum of the teachers' responses regarding use of the language. A value of one was assigned to each of the following: a) the language is the individual's native language; b) the language has been used extensively since childhood; c) it was the language of instruction for the individual's elementary or secondary education; d) it was the language of instruction for the individual's college/university studies; (e) the individual studied this language as a foreign language in school. The possible scores ranged from 1-4 since, if (b) or (c) was selected it was not possible to also select (e).

TABLE 6.18. LM-LEP students' academic teachers aggregated: Mean aggregated rating of background in use of English and in use of the student's native language

	English		Students' native language	
	Mean*	No. of Students	Mean*	No. of Students
Grade 1				
LM-LEP:				
Spanish	3.1	4,470	1.6	4,390
Chinese	3.0	192	1.4	200
Other	3.3	612	0.5	615
LM-LEP Overall	3.1	5,274	1.4	5,205
Grade 3				
LM-LEP:				
Spanish	3.3	3,345	1.4	3,245
Chinese	3.2	206	1.2	206
Other	3.3	458	0.6	458
LM-LEP Overall	3.3	4,009	1.3	3,909

*The rating of background in use of each language is based on the sum of the teachers' responses regarding use of the language. A value of one was assigned to each of the following: a) the language is the individual's native language; b) the language has been used extensively since childhood; c) it was the language of instruction for the individual's elementary or secondary education; d) it was the language of instruction for the individual's college/university studies; (e) the individual studied this language as a foreign language in school. The possible scores ranged from 1-4 since, if (b) or (c) was selected it was not possible to also select (e).

overall were given scores of less than 20, scores which represent less than fluent ability in the language.[1]

6H H. CHARACTERISTICS OF ENGLISH LANGUAGE ARTS INSTRUCTION

Special attention was paid to English instruction in this study because of the major role it is expected to play in English language development and in general academic achievement. As a first step toward providing a more comprehensive description of English language arts instruction, teachers of English language arts for individual students were identified. The English language background of these teachers and the emphasis they placed on particular language skill areas within oral English, reading, and writing were then examined. These data are presented for main English teachers and also are aggregated for all English teachers of an individual student.

6H.1 ENGLISH LANGUAGE PROFICIENCY BACKGROUND OF ENGLISH LANGUAGE ARTS TEACHERS

The mean English language background of the main and aggregated English language arts teachers are presented in Table 6.19. These data are very similar to those reported for main academic teachers.

6H.2 INSTRUCTIONAL EMPHASIS ON ENGLISH LANGUAGE ARTS SKILL AREAS

In the Instructional Staff Questionnaire, teachers indicated the extent to which instruction was presented to LM-LEP students in certain skill areas of oral English, reading, and writing. In the area of oral English instruction, the skill areas rated were development of vocabulary, comprehension and production of everyday conversational English,

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[1] The cases of teachers with scores of less than 20 were accounted for primarily by two districts. These two districts will be of special interest in the analyses to be conducted in the second and third years of the study in which instructional services will be related to student academic outcomes.

TABLE 6.19. LM-LEP and EP/LIS students' teachers of English language arts: Background in use of English for main English teachers and for all English teachers aggregated

	Main English Teacher		Aggregated English Teacher	
	Mean Rating*	No. of Students	Mean Rating*	No. of Students
Grade 1				
LM-LEP:				
Spanish	3.2	4,140	3.2	4,456
Chinese	2.9	187	3.0	191
Other	3.2	525	3.3	601
LM-LEP Overall	3.2	4,852	3.2	5,248
EP/LIS	3.6	698	3.6	817
Grade 3				
LM-LEP:				
Spanish	3.2	3,052	3.3	3,322
Chinese	3.1	194	3.2	199
Other	3.3	429	3.3	458
LM-LEP Overall	3.2	3,675	3.3	3,979
EP/LIS	3.6	787	3.6	828

*The rating of background in use of each language is based on the sum of the teachers' responses regarding use of the language. A value of one was assigned to each of the following: a) the language is the individual's native language; b) the language has been used extensively since childhood; c) it was the language of instruction for the individual's elementary or secondary education; d) it was the language of instruction for the individual's college/university studies; (e) the individual studied this language as a foreign language in school. The possible scores ranged from 1-4 since, if (b) or (c) was selected it was not possible to also select (e).

comprehension and production of the type of English used in the classroom, and pronunciation. In the area of reading, the skill areas rated were: the mechanics of reading (e.g., decoding); reading comprehension of narrative materials, reading comprehension of expository materials, and use of the dictionary. In the area of writing, the skills included were: spelling, mechanics of writing (e.g., punctuation), paragraph and simple story writing, and handwriting.

The ratings ranged from 1 to 4: 1 indicated no instruction in the area, 2 indicated that the skill was taught only incidentally, 3 indicated a relatively small amount of formal instruction, and 4 indicated a substantial amount of formal instruction. A mean rating of amount of formal instruction provided was obtained for each teacher for the three areas of English: oral English, reading, and writing. Table 6.20 presents the mean ratings of amount of formal instruction for the three English language arts areas for LM-LEP students' main English teachers by language group. In Table 6.21, the same data are presented for the aggregated responses of all English language arts teachers of individual students.

The mean ratings based on the main English teacher data indicate that there was a heavy emphasis on formal instruction in oral English at grade 1 and on oral English, reading English, and writing English at grade 3. As might be expected, there was less of an emphasis on instruction in English reading and writing skills at grade 1 than at grade 3.

On the basis of a comparison of Tables 6.20 and 6.21, it appears that the main English teachers placed slightly more emphasis on reading and writing instruction than did other English teachers. This difference may indicate that auxiliary English teachers were placing more emphasis on oral English skills and less emphasis on reading and writing skills than were main English teachers.

TABLE 6.20. Mean rating* of instructional emphasis on oral English, reading, and writing of English for LM-LEP students' main English teachers

	Oral English		Reading English		Writing English	
	Mean*	No. of Students	Mean*	No. of Students	Mean*	No. of Students
Grade 1						
Spanish	3.7	4,108	2.4	4,106	2.8	4,101
Chinese	3.9	195	3.3	195	3.3	195
Other	3.7	539	3.4	539	3.6	534
Grade 1 Overall	3.7	4,842	2.6	4,840	2.9	4,830
Grade 3						
Spanish	3.7	3,038	3.4	3,039	3.5	3,039
Chinese	3.7	194	3.6	194	3.8	194
Other	3.8	424	3.8	424	3.8	424
Grade 1 Overall	3.7	3,656	3.4	3,657	3.6	3,657

*The ratings ranged from 1 to 4: 1 indicated no instruction in the area, 2 indicated that the skill was taught only incidentally, 3 indicated a relatively small amount of formal instruction, and 4 indicated a substantial amount of formal instruction.

TABLE 6.21. Aggregated mean ratings* of instructional emphasis on oral English reading, and writing of English for LM-LEP students' English teachers

	Oral English		Reading English		Writing English	
	Mean*	No. of Students	Mean*	No. of Students	Mean*	No. of Students
Grade 1						
Spanish	3.7	4,433	2.4	4,431	2.7	4,427
Chinese	3.9	199	3.1	199	3.2	199
Other	3.7	612	3.2	612	3.4	607
Grade 1 Overall	3.7	5,244	2.5	5,242	2.8	5,233
Grade 3						
Spanish	3.7	3,310	3.3	3,310	3.4	3,310
Chinese	3.7	200	3.4	200	3.6	200
Other	3.8	452	3.6	452	3.6	452
Grade 1 Overall	3.7	3,962	3.3	3,962	3.4	3,962

*The ratings ranged from 1 to 4: 1 indicated no instruction in the area, 2 indicated that the skill was taught only incidentally, 3 indicated a relatively small amount of formal instruction, and 4 indicated a substantial amount of formal instruction.

I. SUMMARY

This chapter examines the nature of the instructional services provided to students in the study, including the characteristics of the curriculum, the languages used for instruction, the instructional organization, materials used, and the characteristics of the instructional staff providing the instruction.

An important and consistent finding concerns differences in instruction for LM-LEP students of different language backgrounds. For example, in the data on instructional services, Spanish language students were found to be less likely to receive instruction in English language arts, and more likely to receive native language arts instruction than were Chinese and other language students. Spanish language students were also found to be receiving more instruction presented in their native language and, consistent with these findings, they were also more likely to be using native language materials; in addition, Spanish language students were more likely to receive simplified English for instruction presented in English. Main teachers of Spanish language students were distinguished from the teachers of Chinese and other language LM-LEP students in that they more frequently had taken college coursework related to the instruction of LM-LEP students, but they were shown to have somewhat less teaching experience overall.

In contrast, Chinese language students were found to be somewhat less likely to receive instruction in non-language arts academic subjects than Spanish language and other language students. Compared to the Spanish language students, Chinese language students received more regular instruction in English language arts, but less special instruction in English. The Chinese language students were more often taught by one teacher only, and in comparison to other LM-LEP students, were more likely to be instructed in whole class instructional situations. The use of aides and volunteers was reported more often by Chinese students' main academic teachers. Also, their teachers, relative to the teachers of Spanish language students, were less likely to have taken college courses related to instruction of LM-LEP students.

The teachers in the study in general were found to be proficient in the use of English; in all but two districts at least 90 percent of teachers were rated as fluent speakers, close to or at a native speaker level of proficiency in oral English. Overall, about a quarter of the students' main teachers at each grade had backgrounds in English but not in the student's native language; about 70 percent had backgrounds both in English and in the student's native language.

CHAPTER 7

SERVICE CLUSTERS AND SEQUENCES

Chapter 7. SERVICE CLUSTERS AND SEQUENCES[1]

7A A. SERVICE CLUSTERS

As noted in Chapter 2, a service cluster is defined as a set of instructional services provided to a particular student at a particular period of time. Table 7.1 reproduces the table first presented in Chapter 2 showing the 6 major service cluster groups and 32 specific clusters, as well as the values of the instructional variables associated with each cluster type. During the first year of this Longitudinal Study detailed information concerning service clusters was collected at three times: during the fall, winter, and spring of the academic year 1984-1985. The data collection instruments relevant to cluster assignment are the Student Teacher Record, and the Student Instructional Record. The Student Teacher Record, completed by the student's main teacher, provided data concerning native language arts instruction and the names of all other teachers who provided instruction in English language arts, math, science, or social studies (including ethnic heritage). All of the listed teachers then completed a Student Instructional Record on each of the students in the study. This form provided information on subjects taught, and language use in the classroom.

7A.1 OPERATIONALIZING THE DEFINITION

As noted in Table 7.1, the key variable for major cluster designation was the Extent of Use of Native Language in Academic Instruction. Based on responses in the Student Instructional Record, the amount of time a teacher provided instruction in math, science, social studies, and ethnic heritage in the native language to this student was divided by the total amount of time devoted to these subjects. The following rules were then applied:

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[1] Abbreviations and special terms used in this study are defined in the glossary, in Appendix A.

TABLE 7.1. Instruction service clusters

Cluster Type \ Cluster Variable	Extent of Native Language Use in Non-language arts Instruction[a]	Special Instruction in English Provided	Use of Simplified English for Non-language Arts Instruction[a]	Use of Simplified English for English Instruction	Instruction in Native Language Arts
A. Instruction Primarily Using Native Language	High use of the native language				
A1		Yes/no[b]	Yes/no[b]	Yes	Yes
A2		Yes/no	Yes/no	No	Yes
A3		Yes/no	Yes/no	Yes	No
A4		Yes/no	Yes/no	No	No
B. Instruction using Both Native and English Languages Extensively	Moderate use of the native lang.				
B1		Yes/no	Yes	Yes	Yes
B2		Yes/no	Yes	No	Yes
B3		Yes/no	No	Yes	Yes
B4		Yes/no	No	No	Yes
B5		Yes/no	Yes	Yes	No
B6		Yes/no	Yes	No	No
B7		Yes/no	No	Yes	No
B8		Yes/no	No	No	No
C. Emphasis on English, with Some Instruction Using Native Language	Low use of the native language				
C1		Yes/no	Yes	Yes	Yes
C2		Yes/no	Yes	No	Yes
C3		Yes/no	No	Yes	Yes
C4		Yes/no	No	No	Yes
C5		Yes/no	Yes	Yes	No
C6		Yes/no	Yes	No	No
C7		Yes/no	No	Yes	No
C8		Yes/no	No	No	No
D. Instruction Using English, with Special Instruction in English	Minimal or no use of the native language				
D1		Yes	Yes	Yes	Yes
D2		Yes	Yes	No	Yes
D3		Yes	No	Yes	Yes
D4		Yes	No	No	Yes
D5		Yes	Yes	Yes	No
D6		Yes	Yes	No	No
D7		Yes	No	Yes	No
D8		Yes	No	No	No
E. Instruction Using English, with No Special Instruction in English	Minimal or no use of the native language				
E1		No	Yes in at least one column[b]		Yes
E2		No	No	No	Yes
E3		No	Yes in at least one column		No
F. All Instruction in English, with No Special LEP Service	Minimal or no use of the native language	No	No	No	No

[a] Non-language arts instruction includes Math, Science, and Social Studies (including Ethnic Heritage).

[b] Notations used in this table indicate the following: Yes/no - The variable may or may not present;
Yes in at least one column - There is primarily use of simplified English for non-language arts instruction or primarily use of simplified English for English language arts instruction; or there is primarily simplified English in both non-language arts instruction and English language arts instruction.

- "Heavy use of the native language" was considered to be native language use greater than 87.5 percent. The resultant major cluster type was A.

- "Moderate use of the native language" was considered to be native language use equal to or greater than 37.5 percent and equal to or less than 87.5 percent. The resultant major cluster type was B.

- "Low use of the native language" was considered to be native language use equal to or greater than 7.5 percent and less than 37.5 percent. The resultant major cluster type was C.

- "Minimal or no use of the native language" was considered to be native language use less than 7.5 percent. The resultant major cluster type was D, E, or F depending on whether or not special instruction in English or other special services were provided.

Table 7.2 presents breakdowns of percentage of native language use within the major cluster designations for first and third graders based on the winter data collection. Native language use received by students designated as receiving cluster A services was primarily at the high end of the range for first graders, between 94 percent and 100 percent. For the third grade students receiving cluster A services the distribution was more evenly divided between the high and low end of the range.

Cluster B included students with the widest range of native language use, between 37.5 and 87.5 percent. For both first and third grade students there was a good distribution of students across that range, with about half the students receiving 37.5 percent to 57.5 percent and half receiving from 57.5 to 87.5 percent.

Similarly, the students designated as receiving cluster C services were fairly evenly distributed across the 30 percent range of that cluster type. Roughly one-third was in each third of the range.

In the overwhelming majority of the cases in clusters D, E, and F, "minimal or no use of the native language" in practice meant that the native language was never used. This ranged from 67 percent of the cases for third grade cluster D students to 93 percent of the cases for third grade cluster F students. The number who were in the upper third of the allowable range varied from a high of 9 percent for third grade cluster D students to a low of 2 percent for the third grade cluster F students.

TABLE 7.2. Distribution of percentage of native language use: for winter clusters
Based on LM-LEP students

Percent Native Language Use in Math, Science, Social Studies, and Ethnic Heritage	First Grade Freq.	First Grade Percentage	Third Grade Freq.	Third Grade Percentage
Cluster A: Native language use 87.5 percent or greater				
94.1 - 100	391	66%	51	49%
87.5 - 94	201	34	54	51
Total	592	100%	105	100%
Cluster B: Native language use equal to or greater than 37.5 and equal to or less than 87.5				
77.6 - 87.5	171	15%	65	10%
67.6 - 77.5	161	14	101	16
57.6 - 67.5	194	17	95	15
47.6 - 57.5	364	32	248	39
37.5 - 47.5	263	23	120	19
Total	1,153	100%	629	100%
Cluster C: Native language use equal to or greater than 7.5 and less than 37.5				
27.6 - 37.4	178	23%	241	26%
17.6 - 27.5	315	40	301	33
7.5 - 17.5	287	37	369	41
Total	780	100%	911	100%
Cluster D: Native language use is less than 7.5 percent				
5.1 - 7.4	36	4%	60	8%
2.6 - 5.0	149	18	122	16
.1 - 2.5	40	5	80	10
0%	624	73	523	67
Total	849	100%	785	100%
Cluster E: Native language use is less than 7.5 percent				
5.1 - 7.4	12	5%	14	7%
2.6 - 5.0	23	9	18	9
.1 - 2.5	0	0	10	5
0%	226	87	155	79
Total	261	100%	197	100%
Cluster F: Native language use is less than 7.5 percent				
5.1 - 7.4	16	5%	7	2%
2.6 - 5.0	27	8	15	5
.1 - 2.5	2	1	1	0
0%	294	87%	305	93%
Total	339	100%	328	100%

While clusters D, E, and F were not distinguished by the extent to which they employed the native language in academic instruction, they were distinguished by such factors as a special program of instruction in English, a particular approach to using the English language within the curriculum, or the teaching of the native language as a subject of instruction.

7A.2 ENGLISH LANGUAGE USE AND SPECIAL PROGRAMS

During the winter and spring data collections, teachers indicated for each student whether they provided "Special Instruction in English." This was defined as an "Instructional program, such as ESL, that utilized materials and methods especially designed for teaching English to LM-LEP students." If any of a student's teachers answered yes and went on to indicate how many hours such services were provided, then that student's services were designated D rather than E or F. Data collection in the fall was somewhat different in that it did not adequately determine whether a special program in English was provided and, therefore, the major clusters D, E, and F could not be distinguished for the fall data.[1]

Because of a desire to increase clarity and theoretical focus, the questions asked regarding special approaches to using the English language were also changed after the first data collection. In the fall the teachers were asked for each of the subjects whether they used "controlled English"[2] to any extent. In later data collection periods, the term "controlled

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[1] It was anticipated that information regarding special instruction in English would be gathered in the fall. However, because of implementation difficulties, these data could not be reliably gathered as planned. Based on the fall experience, the study forms and implementation procedures were revised so that full and reliable information regarding instructional language use could be efficiently collected from teachers. The revisions were implemented successfully during winter and spring data collections.

[2] "Controlled English" was defined as "a program of English language use designed especially for LM-LEP students in which there is a deliberate simplification of vocabulary and syntax. It is marked by the systematic, planned introduction and explanation of new words and grammatical constructions."

English" was replaced by the term "simplified English" and the question was changed so that the teacher responded as to whether the type of English used was primarily regular English or simplified English.[1]

Based on the responses of the student's teachers, a rating of present or absent was made for each student for "Use of Simplified English for Academic Instruction" and "Use of Simplified English for English Instruction."[2] Finally, whether the student received native language arts instruction was determined based on whether the reported number of hours for these subjects was greater than zero.

The distinction between major cluster E and major cluster F was based on the presence (cluster E) or absence (cluster F) of at least one of three special services: Use of Simplified English in Academic Instruction, Use of Simplified English in English Instruction, or Instruction in Native Language Arts.

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[1] For each subject it was asked, "When English is used for instruction, either alone or in combination with another language, is the type of English used primarily regular English or simplified English?" The definitions of both terms were printed on the form: "Regular English approximates the types of English ordinarily used with a native English speaker of this age. Simplified English refers to the deliberate simplification of vocabulary and sentence structure so that the English used is more easily comprehended by a language-minority, limited-English-proficient child."

[2] The presence or absence of Simplified English in Academic Instruction was determined as follows: For the fall data collection period, of the total amount of time English was used in Math, Science, Social Studies, and Ethnic Heritage, if controlled English was available a majority of that time, then simplified English was determined to be present. The same procedures were used to determine the presence or absence of Simplified English in English Instruction except that rather than the academic subjects the focus was on the various varieties of English language arts instruction.

7A.3 DISTRIBUTION OF FIRST AND THIRD GRADERS ACROSS CLUSTERS

The five variables used to determine major cluster groups were also the variables used, in various combinations, to assign students to the 32 clusters. Table 7.3 presents the distribution for first-grade LM-LEP students during the fall, winter, and spring of the first year of the Longitudinal Study while Table 7.4 presents this same information for third-grade LM-LEP students.

The total number of students assigned to service clusters increased from the fall to the winter, and again from the winter to the spring. There were two reasons for these increases. First, approximately 350 students were added to the study during the winter data collection period. These were either LM-LEP students who enrolled in the studied schools after the fall data collection period or students for whom parental permission was not obtained until after the fall data collection. Second, the refinements in the instruments and procedures enabled the field staff to reduce the number of students for whom there was incomplete or inconsistent data.

The number of LM-LEP students in the major cluster A was similar for the first grade across all three data points. For the third grade the percentage was both much smaller and obviously decreasing: from 5.6 percent in the fall to 1.5 percent in the spring. As might be expected in a cluster that heavily utilizes a student's native language, very few students were in clusters A3 or A4, in which native language arts were not taught.

The distribution of students in cluster B was similar to that in cluster A. In both the first and the third grade, relatively few students were assigned to the B5 through B8 clusters, in which the native language was not taught. Within the cluster B, the use of simplified English appeared to be very common. For example, using the first grade winter data, simplified English predominated in both academic instruction and in English language arts instruction for 40 percent of the students receiving cluster B services (in clusters B1 and B5). For 16 percent (in the B2 and B6 clusters), simplified English predominated only in academic instruction, while in another 11 percent simplified English predominated only in English language arts instruction.

TABLE 7.3. Distribution of service clusters for first-grade LM-LEP students

Cluster Type	Fall Freq.	Fall Percentage	Winter Freq.	Winter Percentage	Spring Freq.	Spring Percentage
A1	348	8.9%	283	7.1%	260	6.3%
A2	181	4.6	246	6.2	312	7.5
A3	--	--	54	1.4	13	.3
A4	1	--	9	.2	2	--
Total As	530	13.5	592	14.9	587	14.1
B1	460	11.7	445	11.2	324	7.8
B2	52	1.3	180	4.5	235	5.7
B3	266	6.8	110	2.8	42	1.0
B4	418	10.6	368	9.3	457	11.0
B5	33	.8	13	.3	34	.8
B6	2	--	4	.1	40	1.0
B7	27	.7	18	.5	16	.4
B8	41	1.0	15	.4	6	.1
Total Bs	1,299	33.1	1,153	29.0	1,154	27.8
C1	113	2.9	252	6.3	191	4.6
C2	6	.2	37	.9	51	1.2
C3	28	.7	60	1.5	71	1.7
C4	270	6.9	267	6.7	522	12.6
C5	102	2.6	36	.9	56	1.3
C6	1	--	26	.7	5	.1
C7	7	.2	32	.8	1	--
C8	125	3.2	70	1.8	150	3.6
Total Cs	652	16.6	780	19.6	1,047	25.2
D1/E1	162	4.1				
D2/E1	61	1.6				
D3/E1	58	1.5				
D4/E2	370	9.4				
D5/E3	224	5.7				
D6/E3	5	.1				
D7/E3	84	2.1				
D8/F	485	12.3				
Total DEF	1,449	36.9				
D1			110	2.8%	105	2.5%
D2			9	.2	20	.5
D3			18	.5	39	.9
D4			216	5.4	263	6.3
D5			72	1.8	98	2.4
D6			40	1.0	30	.7
D7			20	.5	5	.1
D8			364	9.2	337	8.1
Total Ds			849	21.4	897	21.6
E1			39	1.0	22	.5
E2			154	3.9	136	3.3
E3			68	1.7	44	1.1
Total Es			261	6.6	202	4.9
F			339	8.5	266	6.4
TOTAL	3,930	100.0%	3,974	100.0%	4,153	100.0%

TABLE 7.4. Distribution of service clusters for third-grade LM-LEP students

Cluster Type	Fall		Winter		Spring	
	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage
A1	93	3.1%	35	1.2	42	1.3%
A2	70	2.4	52	1.8	5	.2
A3	2	.1	2	.1	--	--
A4	--	--	16	.5	--	--
Total As	165	5.6	105	3.6	47	1.5
B1	226	7.6	256	8.7	190	5.9
B2	8	.3	116	3.9	90	2.8
B3	113	3.8	67	2.3	24	.7
B4	304	10.2	94	3.2	214	6.6
B5	42	1.4	29	1.0	22	.7
B6	7	.2	8	.3	1	--
B7	4	.1	9	.3	24	.7
B8	42	1.4	50	1.7	63	1.9
Total Bs	746	25.1	629	21.3	628	19.4
C1	105	3.5	211	7.1	178	5.5
C2	36	1.2	101	3.4	75	2.3
C3	83	2.8	38	1.3	63	1.9
C4	162	5.5	334	11.3	380	11.7
C5	61	2.1	30	1.0	29	.9
C6	5	.2	3	.1	26	.8
C7	17	.6	15	.5	26	.8
C8	107	3.6	179	6.1	216	6.7
Total Cs	576	19.4	911	30.8	993	30.7
D1/E1	70	2.4				
D2/E1	30	1.0				
D3/E1	65	2.2				
D4/E2	397	13.4				
D5/E3	192	6.5				
D6/E3	11	.4				
D7/E3	92	3.1				
D8/F	628	21.1				
Total DEF	1,485	50.0				
D1			89	3.0%	65	2.0%
D2			3	.1	3	.1
D3			36	1.2	32	1.0
D4			265	9.0	286	8.8
D5			83	2.8	77	2.4
D6			12	.4	34	1.1
D7			42	1.4	37	1.1
D8			255	8.6	297	9.2
Total Ds			785	26.6	831	25.7
E1			31	1.0	27	.8
E2			101	3.4	228	7.0
E3			65	2.2	85	2.6
Total Es			197	6.7	340	10.5
F			328	11.1	399	12.3
TOTAL	2,972	100.0%	2,955	100.0%	3,238	100.0%

The number of LM-LEP students receiving cluster C instruction, (academic instruction emphasizing English but with some systematic instruction in the native language) increased during the course of the year, from 652 for the first grade (17 percent) to 1047 (25 percent), and from 576 third graders (19 percent) to 993 (31 percent). Most of the students in cluster C continued to receive instruction in their native language arts at the same time they were receiving academic instruction primarily in English. Again using the winter data collection as a reference point, the proportion of students in the cluster C receiving native language arts instruction was 79 percent for the first graders and 75 percent for the third graders.

Compared to students in clusters A and B, many fewer of the students in cluster C received instruction in simplified English. For example, using the winter data, 43 percent of the first grade students received cluster C instruction (in the C4 and C8 clusters) were in situations in which simplified English predominated neither in English language arts nor in academic instruction. For the third grade students, the corresponding figure was 56 percent.

Discussion of clusters D, E, and F is somewhat complicated because of the inability of the fall procedures to distinguish clearly whether or not special instruction in English was provided. In the fall there were clusters designated as Dl/El, which signifies that minimal or no use is made of the native language and that simplified/controlled English is used in both academic and English language arts instruction, but it is unknown whether special instruction is received. Cluster D2/El, cluster D3/El and so on are similar blends of certainty and uncertainty.

Nonetheless, a number of trends can be noted. In cluster D (English Language Instruction Primary with Special Instruction in English), although instruction is almost entirely in English, roughly half of LM-LEP students still received instruction in their native language. Again using the winter data collection as a reference point, 62 percent of the first graders and 50 percent of the third graders received native language arts instruction.

Perhaps the most interesting finding in these two tables concerns the use of simplified English within cluster D. Although these LM-LEP students were receiving a special program of instruction in English, such as a structured ESL curriculum, apparently only for approximately half or less of these students did teachers report that they usually adjust their English usage so as to be more easily comprehended by LM-LEP students. Once again using the winter data, 68 percent of the first-graders were in situations in which neither in academic instruction nor in English instruction did simplified English predominate. The corresponding figure for the third grade was 50 percent.

The cluster E category was something of a residual category, because the students were not receiving either significant instruction using the native language or special English instruction, but did receive a service that differentiated them from the cluster F in which no identifiable instructional services were received. For the first graders classified as cluster E based on the winter data, the most common service received was instruction in native language arts, such as reading. This was true of 59 percent of the first grade students in cluster E and 51 percent of the third grade students. Another group, 15 percent of the first graders and 16 percent of the third graders, received both native language arts instruction and a predominance of simplified English in academic or English language arts instruction. The remaining 26 percent of the first graders and 32 percent of the third graders in cluster E received a predominant amount of simplified English in academic instruction or English language arts but did not receive native language arts instruction.

Students who were classified as cluster F received what amounted to essentially a standard all-English first or third grade curriculum which had none of the features the study's instruments were designed to detect. During the winter data collection period 8 percent of the first graders and 11 percent of the third graders were so classified.

There were also a number of LM-LEP students during each data collection period for whom forms were completed but who could not be assigned a service cluster. In many cases this was because forms were not filled out completely.[1] In other cases it was because the number of hours per week reported was either too low (less than 10), or too high (more than 40). Finally, in a very small number of cases clusters were not assigned because students received more than 7.5 percent of their academic instruction in a language that was neither English nor their native language. During the spring data collection, for example, 7 first graders and 4 third graders fell into this "unclassified" category.

7B

B. CLUSTER SEQUENCES

Tables 7.3 and 7.4 present more or less snapshot pictures of the services provided to LM-LEP students at three points during the 1984-85 academic year. What the tables are unable to indicate is the extent to which services changed over the course of the year for individual students, either because they transferred between programs or because the programs themselves changed. What is needed is a way to explore the sequence of services received both by individual students and by groups of students.

Perhaps the most straightforward way to approach the issue of sequences is just to assign each student a three part code consisting of their fall, winter, and spring clusters. However, this method produces an unmanageably large set of sequences.[2]

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[1] A form was considered incomplete for the purpose of assigning a service cluster, if, for example, it was indicated that math was taught, but items such as "number of hours taught per week" or "percent native language use" were left blank.

[2] The fall data provide 30 possibilities--29 plus missing or unclassifiable. The winter and spring data each provide 33 possibilities--32 cluster codes plus missing or unclassifiable. Thus there are 30 times 33 times 32 possible sequences--for a total of 32,670. Of course since there are only 9000 cases the actual number would not be this high; nevertheless, it would be unmanageable.

In order to produce a workable set of sequences, a number of simplifying steps were taken. First, it was decided to work only with the major cluster distinctions which were derived from the two variables "Percent of Native Language in Academic Instruction" and, for the winter and spring data, "Special English Instruction." Thus for the fall, there are 4 categories of services: A, B, C, and DEF. For the winter and spring there are five basic categories: A, B, C, D, and EF.[1]

Second, it was decided to focus primarily on the transition in services between the beginning of the year and the end of the year, the fall-spring sequence. However, if data were missing or incomplete for either of these points, then the winter data would be used in place of the missing data point. Proceeding in this manner, students for whom there were good data from at least two data collection periods were assigned to one of the 20 possible combinations.[2]

7B.1 DISTRIBUTION OF SERVICE CLUSTER COMBINATIONS

Table 7.5 presents the resulting combinations for the first and third-grade LM-LEP students. Some interesting patterns are readily observable. Most of those who started the year receiving cluster A services ended the year receiving other types of services, most commonly cluster B services.

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[1] In the fall, D cannot be distinguished from E and F because information concerning "Special English Instruction" is not available. Also, using only "Special English Instruction" and "Percent of Academic Instruction in the Native Language" it is not possible to make the E-F distinction which relies on "Instruction in Simplified English" and/or "Native Language Arts Instruction." It is felt that for the purpose of establishing sequences the minimal services offered to LM-LEP students in an E cluster are best grouped with the lack of services denoted by an F cluster.

[2] Adequate data were available from both the fall and the spring for 2837 first graders and 2459 third graders. By substituting winter data for missing fall or spring data, it was possible to assign another 1279 first graders and 839 third graders to service cluster combinations.

TABLE 7.5. Distribution of cluster combinations
Based on LM-LEP students

Cluster combination		First Grade			Third Grade		
Initial cluster	Final cluster	Frequency	Percentage of all clusters	Percentage within initial cluster	Frequency	Percentage of all clusters	Percentage within initial cluster
A	A	225	5%	41%	32	1%	18%
A	B	255	6	46	73	2	41
A	C	28	1	5	43	1	24
A	D	36	1	7	22	1	12
A	EF	7	0	1	7	0	4
		551	(13%)	100%	(177)	(5%)	100%
B	A	139	3	10%	8	0	1%
B	B	775	19	57	419	13	55
B	C	376	9	28	239	7	31
B	D	53	1	4	51	2	7
B	EF	6	0	0	46	1	6
		(1349)	(32%)	100%	(763)	(23%)	100%
C	A	1	0	0%	0	0	0%
C	B	96	2	14	91	3	13
C	C	354	9	50	400	12	56
C	D	209	5	29	156	5	22
C	EF	51	1	7	61	2	9
		(711)	(17%)	100%	(708)	(22%)	100%
DEF	A	2	0	0%	0	0	0%
DEF	B	107	3	7	56	2	3
DEF	C	304	7	20	377	11	23
DEF	D	654	16	43	612	19	37
DEF	EF	438	11	29	597	18	36
		(1505)	(37%)	100%	(1642)	(50%)	100%
	Total	4116	100%		3290	100%	

For them, the use of native language in the classroom was reduced somewhat. A much smaller number experienced over the course of the year a more drastic reduction in the amount of native language they received.

Of those who started the year in cluster B (with native language use between 37.5 percent and 87.5 percent) most continued to receive cluster B services throughout the year. One hundred and thirty nine of the first graders and eight of the third graders moved from cluster B to the cluster A, indicating an increase in native language use. Quite possibly this change is more a statistical artifact than a substantial change in services--their academic instruction wavered around 87.5 percent, somewhat less in the fall, somewhat more in the spring. However, for those who began the year as a B, it was much more common for the amount of native language use to go down, shifting them into the C category.

Like those in cluster B, most of the LM-LEP students who began the year receiving cluster C services ended the year receiving the same basic type of services. In some cases the data indicated an increase in native language in academic instruction, but in many more cases there was a decrease to cluster D and cluster EF, indicating that for them the use of the native language had become minimal.

Those who began the year receiving clusters D, E, or F also seemed to end the year receiving similar services. The largest number ended the year in cluster D receiving Special Instruction in English with minimal academic instruction in the native language. Almost as many ended the year classified as receiving cluster E or cluster F services, that is, minor services or none at all. A particularly interesting group, however, are those who moved to clusters C, B, or A. To some extent the shift to cluster C services can be explained by a borderline shift. Their teachers occasionally used their native language in academic instruction; in the fall it was a little below 7.5 percent, in the spring a little above. However, it is also possible, and certainly even more plausible for those who shifted from DEF to B or A, that the change occurred when the child was transferred from one program to another subsequent to the fall data collection. A typical scenario might be that at the beginning of the year the child was assigned to an all-English-medium classroom, but after testing and observation, it was decided to transfer the child to a program which employed the native language.

7C

C. CORRELATES OF MAJOR CLUSTER SEQUENCES

Along with understanding which cluster combinations occurred in the LM-LEP student population, it is important to gain an understanding of the extent to which various types of students were served by the various combinations of service clusters. Variables of interest in this regard are the native language background of the students, the degree of English proficiency the students exhibited at the beginning of the school year, and the level of development of cognitive abilities (as measured by the Raven Progressive Matrices test). Insofar as a number of the cluster combinations imply basically the same educational experiences, it will be helpful in the following discussion if they are grouped into 9 major cluster sequences. Table 7.6 indicates the manner in which the 20 service cluster combinations are aggregated.

The four cluster combinations, A/A, A/B, B/A, and B/B, all of which indicate a substantial use of the native language in academic instruction are placed together in the first cluster sequence, "Continued Emphasis on Native Language." The second cluster sequence, "High or Moderate to Low Native Language Use," encompasses cluster combinations A/C and B/C and is marked by a transition during the year from the high or relative high use of the native language to low use of the native language in academic instruction.

The third cluster sequence, "High or Moderate to Minimal Native Language Use," combines the cluster combinations A/D, A/EF, B/D, and B/DEF. As shown in Table 7.6, these quick transitions to all-English-medium instruction occurred relatively infrequently in our sample.

TABLE 7.6. Cluster sequences corresponding to cluster combinations

Cluster Sequence	Includes Cluster Combinations
1. Continued emphasis on native language	A/A, A/B, B/A, B/B
2. High or moderate to low native language use	A/C, B/C
3. High or moderate to minimal use of native language	A/D, B/D, A/EF, B/EF
4. Low use to low or moderate use	C/C, C/B
5. Low use to minimal use	C/D, C/EF
6. Marked increase in native language use	C/A, DEF/A, DEF/B
7. No use to low use of native language	DEF/C
8. No use of native language but with special instruction in English	DEF/D
9. No use of native language and no special instruction in English	DEF/EF

The fourth cluster sequence, "Low Use to Low or Moderate Use of the Native Language," combines the relatively common sequence C/C, with the much less common sequence C/B. The rationale is that in most cases the shift from C to B is merely a short shift from just below the cutoff point of 37.5 percent to just above it. The educational experience is basically the same.

The fifth cluster sequence, "Low Use to Minimal Use," combines the relatively uncommon C/D and C/EF combinations. In both, the students' year began with a low level and ended with a minimal level of academic instruction in the native language.

The sixth cluster sequence, "Marked Increase in Native Language Use," combines the combinations C/A, DEF/A, and DEF/B, all of which indicate a jump of at least 30 percent in use of the native language from the beginning to the end of the year. As information from none of the schools suggested that such increases were programmatically based, it is believed that in most cases the jump was due to transferring either between programs or between schools.

The seventh cluster sequence, "No Use of Native Language to Low Use" is made up only of the relatively common DEF/C sequence. While it implies, as the sixth cluster sequence does, an increase in native language use, the change in most cases is believed to be quite small, from just below the 7.5 percent cut-off to just above it.

In both cluster sequences 8 and 9 there is continued minimal use of the native language. What differentiates them is that the former includes special instruction in English, while the latter does not.

7C.1 NATIVE LANGUAGE AND CLUSTER SEQUENCES

In Tables 7.7 and 7.8 the nine cluster sequences are related to the native language of the students. The tables indicate that Spanish language first graders were more likely than other students to be in the first cluster sequence in which the high or moderate use of the native language continued through the year. Correspondingly, they were less likely to be in cluster sequences 8 or 9 in which essentially no academic use of the native language was indicated throughout the year.

TABLE 7.7. Distribution of cluster sequences within native language groups: First grade
Based on LM-LEP students

Cluster Sequences	Percentage of Total Spanish	 Chinese	 Other	Total
1. Continued emphasis on native language	38%	21%	11	34%
2. High or moderate to low native language use	10	27	6	10
3. High or moderate to minimal use of native language	3	--	1	2
4. Low use to low or moderate use	11	12	9	11
5. Low use to minimal use	6	8	6	6
6. Marked increase in native language use	3	--	5	3
7. No use to low use of native language	7	6	10	7
8. No use of native language but with special instruction in English	14	10	33	16
9. No use of native language and no special instruction in English	9	15	19	11
Total	100%	100%	100%	100%
No. of cases	3492	136	488	4116

TABLE 7.8. Distribution of cluster sequences within native language groups: Third grade Based on LM-LEP students

Cluster Sequences	Percentage of Total: Spanish	Chinese	Other	Total
1. Continued emphasis on native language	17%	14%	11%	16%
2. High or moderate to low native language use	9	13	1	8
3. High or moderate to minimal use of native language	4	1	0	4
4. Low use to low or moderate use	15	27	9	15
5. Low use to minimal use	7	2	7	7
6. Marked increase in native language use	2	0	0	2
7. No use to low use of native	11	0	16	11
8. No use of native language but with special instruction in English	18	21	26	19
9. No use of native language and no special instruction in English	16	21	30	18
Total	100%	100%	100%	100%
No. of cases	2773	140	374	3287

The data in Table 7.7 also indicate that almost half (48%) of the first grade Chinese language students initially received instruction that included at least a moderately high level of native language use; but for over half of these students the amount of native language use decreased markedly during the year. The table further shows that the percentage of Chinese language students in cluster sequences 1, 2, and 3 was very close to the percentage of Spanish language students in these sequences. This indicates that proportionately almost as many Chinese language first graders as Spanish language first graders began the year receiving a high or moderate amount of academic instruction using the native language. However, for the Chinese language students, continued emphasis on the native language over the course of the school year was found much less frequently than for the Spanish language students.

LM-LEP first graders whose native language was other than Chinese or Spanish were much less likely to be in cluster sequences 1, 2 or 3; only 18 percent began the year with high or moderate native language use, compared with 51 percent of the Spanish language students and 48 percent of the Chinese language students. The majority of the first graders with other native languages were in cluster sequences 8 and 9, indicating no significant academic use of the native language during the first grade.

A comparison of Tables 7.7 and 7.8 shows that across all three language groups a lower proportion of grade 3 students than grade 1 students were in cluster sequences 1, 2, and 3. A correspondingly higher proportion of grade 3 students were in cluster sequences 8 and 9. Thus, far fewer third grade students than first graders began the year with academic instruction using high or moderate levels of their native language, and many more went through the year without any appreciable amount of academic instruction using their native language.

7C.2 CLUSTER SEQUENCES AND ORAL ENGLISH LANGUAGE PROFICIENCY

Another way of approaching the questions of who the students are in each of the cluster sequences is to explore the extent to which proficiency in the English language is related to cluster sequence. Tables 7.9 and 7.10 present by cluster sequence the scores of the first and third graders on the

TABLE 7.9. Means and standard deviations of total Student Oral Proficiency Ratings in English, within cluster sequence: Cohort A, Grade 1

Based on LM-LEP students

Cluster Sequences	Mean	σ	N
1. Continued emphasis on native language	12.6	5.5	1,278
2. High or moderate to low native language use	14.4	5.4	354
3. High or moderate to minimal use of native language	13.8	6.3	97
4. Low use to low or moderate use	14.9	5.8	402
5. Low use to minimal use	16.4	5.5	240
6. Marked increase in native language	14.8	5.8	106
7. No use to low use of native language	16.5	5.6	279
8. No use of native language but special instruction in English	15.2	5.4	569
9. No use of native language and no special instruction in English	19.3	4.7	384
Total	14.7	5.8	3,709

TABLE 7.10. Means and standard deviations of total Student Oral Proficiency Ratings in English, within cluster sequence: Cohort B, Grade 3
Based on LM-LEP students

Cluster Sequences	Mean	σ	N
1. Continued emphasis on native language	13.7	5.2	498
2. High or moderate to low native language use	15.3	5.8	257
3. High or moderate to minimal use of native language	16.7	4.8	112
4. Low use to low or moderate use	16.0	5.0	447
5. Low use to minimal use	17.1	4.1	185
6. Marked increase in native language	13.1	5.4	55
7. No use to low use of native language	18.1	4.7	357
8. No use of native language but with special instruction in English	17.3	5.0	553
9. No use of native language and no special instruction in English	19.7	4.0	538
Total	16.7	5.2	3,000

Student Oral Proficiency Rating (SOPR) instrument discussed in Chapter 4. For both the first and the third graders, the students in the first cluster sequence had markedly lower scores. Thus, the highest level of native language instruction was occurring with students rated by their teachers as having the least English competence.

In both grades, also, the group with the highest ratings in English competence were in the ninth cluster sequence. Apparently, to a great extent, they were not receiving services because they did not need them. It should be remembered that students entered the study as LM-LEP students if in the fall of 1984 they were classified by their school as being LM-LEP, not necessarily because they began LM-LEP services in the fall of 1984. Many students had already received a year or more of LM-LEP services, in preschool, kindergarten, or in grades 1 and 2, and were already on their way towards being reclassified as no longer a LM-LEP student.

With the exception of the above two groups, the differences among cluster sequences in mean scores were not great. On the whole, students in sequences that used the native language scored a bit lower than students in sequences that did not. The scores of the students in the 6th cluster sequence are interesting in this context. They were students who began the year with little or no native language instruction and then moved into programs with moderate or high amounts of native language instruction. In terms of their mean SOPR total they are much closer, in both the first and third grades, to cluster 1 than to cluster 9. This finding supports the supposition that these students were reassigned because of the low level of their English language skills.

7C.3 CLUSTER SEQUENCES AND COGNITIVE ABILITY

Lastly, the relation of cluster sequence to cognitive reasoning ability, as measured by the Raven Progressive Matrices test, is worth considering. Table 7.11 presents the findings for the first grade group. Overall the differences in the mean are quite small. The largest difference is between the students in the first cluster sequence, who are taught primarily in the native language, and the students in the fifth cluster group who made the transition during the year from low native language use to minimal use.

One way to explain this difference is that even by the first grade many of the students who are quick learners have already left the high-native-language-use classrooms in many schools, or, in the case of the cluster sequence 5 students, left these classrooms during the first year.

The third grade findings, presented in Table 7.12, support and add to this line of argument. The lowest scores were achieved by students in cluster sequence 6, who markedly increased the amount of native language instruction they received during the year. These were students who because of their poor English language skills, or possibly because of their generally poor academic performance, were transferred to classrooms in which native language use was common. Next to these, the lowest group score was obtained by the students in cluster sequence 1. It is noteworthy that the difference between the scores of students in cluster sequence 1 and the highest scoring group was appreciably greater at the third grade level (a difference of 3.5) than at the first grade level (a difference of 1.2). Quite possibly the result came about because of the selection processes discussed in Chapter 5. It may be that over the course of several years the students with high cognitive abilities have been transferred out of the native language classroom and students with low cognitive abilities have been transferred in.

TABLE 7.11. Means and standard deviations of Raven scores within cluster sequence: Cohort A, Grade 1
Based on LM-LEP students

Cluster Sequences	Mean	σ	N
1. Continued emphasis on native language	17.8	5.6	1,327
2. High or moderate to low native language use	18.7	5.9	389
3. High or moderate to minimal use of native language	18.7	6.3	99
4. Low use to low or moderate use	18.3	6.1	430
5. Low use to minimal use	19.1	6.2	249
6. Marked increase in native language	19.0	6.0	96
7. No use to low use of native language	18.0	5.8	278
8. No use of native language but with special instruction in English	19.0	5.8	599
9. No use of native language and no special instruction in English	18.4	5.7	415
Total	18.4	5.8	3,882

TABLE 7.12. Means and standard deviations of Raven scores within cluster sequence: Cohort B, Grade 3
Based on LM-LEP students

Cluster Sequences	Mean	σ	N
1. Continued emphasis on native language	23.6	8.9	469
2. High or moderate to low native language use	25.6	9.1	223
3. High or moderate to minimal use of native language	24.6	8.0	84
4. Low use to low or moderate use	25.3	9.2	383
5. Low use to minimal use	26.2	9.7	150
6. Marked increase in native language	21.7	8.6	35
7. No use to low use of native language	24.6	8.8	305
8. No use of native language but with special instruction in English	25.4	9.2	474
9. No use of native language and no special instruction in English	27.1	9.3	432
Total	25.3	9.2	2,555

7D

D. SUMMARY

This chapter has presented a number of ways of classifying instructional services as a preliminary step towards comparing the efficacy of various instructional services in preparing LM-LEP students to succeed in mainstream all-English-medium classrooms. A service cluster was defined as a set of services provided to a particular student at a particular point in time. Six major service cluster groups and 32 specific clusters were defined in terms of five key instructional variables. More important than the service received at any point in time are the services received over the academic year, or over a series of academic years. The first year major service clusters were linked to produce 20 cluster combinations that represented for each student the instructional services provided both in the early and later parts of the year.

Examination of the combinations showed that, for the most part, students who began the year receiving academic instruction using the native language continued through the year receiving this type of instruction, though often the extent of native language use was less by year's end. Also, the overall extent of native language use was less among third-grade LM-LEP students than among first graders.

Because many of the cluster combinations indicated similar educational experiences, they were combined into nine cluster sequences which represented nine educationally distinct school year experiences for LM-LEP students. The distribution of these cluster sequences by student's native language indicated that overall, Spanish language and Chinese language LM-LEP students were more likely to be in programs which used the native language in instruction than were students from other language backgrounds.

An examination of the oral English proficiency of students in different cluster sequences gave evidence of a relationship between instructional services and English competencies. Those receiving instruction heavily using the native language had as a group the lowest ratings on the oral English proficiency measure, while those LM-LEP students not receiving services were rated as the most proficient.

Finally, students in the nine cluster sequences were compared on the basis of their scores on a measure of cognitive ability, the Raven Progressive Matrices test. Perhaps the most notable finding was that the mean scores of those in cluster sequence 1, "Continued Emphasis on Native Language," was considerably lower among third grade LM-LEP students, relative to third grade LM-LEP students in other cluster sequences, than it was among first grade LM-LEP students relative to first grade LM-LEP students in other cluster sequences.

CHAPTER 8

STUDENT ACADEMIC PERFORMANCE

Chapter 8. STUDENT ACADEMIC PERFORMANCE[1]

In this chapter we discuss the two sets of variables that deal directly with academic performance as an outcome measure. The first is the Stanford Achievement Test and the second is the teachers' ratings of students' academic performance in various aspects of English, math, and the student's native language. Both of these are intended to function as outcome measures and as predictors. They will be included among the variables to be used as predictors of the effects of treatment yet to come, and outcome measures quantifying the effects of treatment to which the student has already been subjected.

8A A. ACHIEVEMENT TEST RESULTS

As discussed in Chapter 2, the vocabulary, reading comprehension, and mathematics subtests of the Stanford Achievement Test (SAT) were selected as the principal measures of academic achievement. This section of the report presents some preliminary data resulting from the administration of the SAT during the first year of the study.[2] It will be recalled that the

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[1] Abbreviations and special terms used in this study are defined in the glossary, in Appendix A.

[2] At one of our sites, Dade County, there was (by prior arrangement) no fall testing, and for the spring testing the school district authorities arranged to provide us with computer tapes containing the results for students in the study, from the routine administration of the Stanford Achievement Test in Dade County schools every spring. We received the tape too late to include Dade County results in the present report; the tape contains valid test scores on 495 of the 503 Dade County students in the study, or 98.4 percent. Nor has data been included on the math test, for those few students to whom the Spanish translation of that test was administered in the fall. It was discovered that the translation of four of the items did not produce items exactly equivalent to the original ones. Since there were only 133 students who took the Spanish test and since these 133 cases would not provide an adequate base for an equipercentile equating, which would be needed to make the Concepts of Number and Mathematics Applications scores comparable to those from the standard English version, it was decided to exclude scores on these two subtests from the analysis, but to retain the Computation scores (which did not require equating). These "Spanish math" computation scores and the Dade County results will be incorporated in the test data in the second year report.

TABLE 8.1a. Means and standard deviations for SAT Primary 1 Form F (Spring '85): Cohort A, Grade 1, Adjusted scores

Native Language		ENGLISH			MATHEMATICS					TOTAL (E + M)
		Vocab.	Reading Comprehension	English Total	Concepts of Number	Computation	Applications	Comput. + Applic.	Math Total	
A. LM-LEP										
1. Spanish	$\bar{X}$	18.4	21.7	40.4	20.2	14.3	13.3	27.7	48.1	89.2
	σ	5.6	8.1	12.2	6.1	5.0	4.4	8.2	13.4	22.9
	N	2252	2245	2056	3172	3259	3059	3032	2936	1972
2. Other Romance Language	$\bar{X}$	19.4	24.2	43.4	21.5	14.7	14.4	29.2	51.2	95.4
	σ	4.4	8.2	10.7	5.7	4.7	4.7	8.3	12.6	20.5
	N	85	85	81	91	90	93	90	88	78
3. Other European	$\bar{X}$	21.9	26.5	48.4	23.2	13.7	15.4	29.0	52.3	101.5
	σ	6.8	9.4	14.6	5.5	5.1	4.1	8.2	13.3	28.3
	N	8	8	8	27	27	27	27	27	8
4. Native American	$\bar{X}$									
	σ									
	N	0	0	0	0	0	0	0	0	0
5. Other Latin Alphabet	$\bar{X}$	20.4	27.6	48.8	23.2	16.8	16.1	33.2	57.0	106.1
	σ	5.3	8.7	12.5	6.0	4.0	3.9	7.0	12.3	21.8
	N	59	61	56	72	82	65	65	64	55
6. Chinese	$\bar{X}$	18.7	28.0	47.8	23.9	17.3	15.9	33.0	57.5	105.4
	σ	5.1	8.0	11.0	5.6	4.1	4.0	7.4	12.6	22.9
	N	88	114	86	143	127	89	88	88	65
7. Other	$\bar{X}$	18.7	25.9	44.7	21.6	15.3	14.1	29.4	51.1	95.7
	σ	4.9	8.4	11.8	5.8	4.8	4.2	7.9	12.8	22.3
	N	214	214	212	221	223	220	219	218	208
8. Unknown	N	70	70	66	73	75	74	74	70	61
LM-LEP TOTAL	$\bar{X}$	18.6	22.6	41.5	20.5	14.5	13.5	28.1	48.8	91.0
	σ	5.6	8.4	12.4	6.1	5.0	4.4	8.2	13.4	23.2
	N	2776	2797	2565	3799	3883	3627	3595	3491	2447
B. EP/LIS	$\bar{X}$	22.4	22.3	48.7	22.8	14.9	15.4	30.4	53.5	102.2
	σ	6.1	9.0	13.3	6.1	5.3	4.2	8.6	13.9	25.2
	N	672	652	617	715	691	667	657	643	555
C. EP/Comp.	$\bar{X}$	22.4	27.8	50.7	21.9	14.2	14.9	29.1	51.2	102.2
	σ	6.2	9.1	13.5	5.7	5.0	4.1	8.2	12.9	24.7
	N	389	404	383	402	393	390	390	384	368

TABLE 8.1b. Means and standard deviations for SAT Primary 2 Form E (Fall '84) and SAT Primary 3 Form F (Spring '85): Cohort B, Grade 3, Adjusted scores

Native Language		ENGLISH						MATHEMATICS										TOTAL (E + M)	
		Vocab.		Reading Comprehension		English Total		Concepts of Number		Computation		Applications		Comput. + Applic.		Math Total			
		Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
A. LM-LEP																			
1. Spanish	$\bar{X}$	14.9	13.8	20.6	26.7	35.8	40.6	20.1	17.5	26.5	26.4	20.2	17.3	46.9	44.0	67.3	61.8	103.9	103.1
	σ	4.5	5.1	8.3	10.0	11.0	13.4	5.9	5.9	7.3	8.9	5.9	7.3	11.4	14.3	16.0	18.8	23.8	29.0
	N	2256	2259	2307	2324	2173	2154	2490	2648	2551	2736	2485	2338	2455	2298	2403	2220	2084	2025
2. Other Romance Language	$\bar{X}$	18.4	16.4	22.5	29.0	41.0	45.0	21.7	20.3	27.0	27.5	20.7	17.7	47.7	45.6	69.9	65.7	112.0	111.0
	σ	7.8	6.9	9.0	12.7	15.3	17.8	7.4	6.7	6.4	7.6	8.6	8.5	14.0	14.8	20.3	20.6	34.2	36.2
	N	39	71	41	72	39	71	39	72	40	73	39	70	39	70	38	69	37	69
3. Other European	$\bar{X}$	18.8	13.4	26.1	28.6	45.9	42.5	20.3	20.0	30.9	29.7	21.4	20.6	51.6	51.0	71.9	72.2	117.8	115.2
	σ	5.4	6.3	9.2	12.4	12.7	18.1	5.7	6.7	8.5	9.8	7.3	8.6	15.0	16.6	20.1	20.4	29.9	36.3
	N	17	19	18	19	17	18	17	22	19	21	17	20	17	20	17	20	17	17
4. Native American	$\bar{X}$	19.0	15.4	23.6	31.7	42.6	48.3	22.5	15.8	28.9	26.2	24.6	15.2	53.5	40.5	76.0	56.3	118.6	107.8
	σ	2.8	4.6	7.6	12.0	9.5	15.2	5.0	5.7	7.5	9.7	6.2	5.9	13.2	12.8	17.7	16.6	25.5	23.3
	N	11	11	11	11	11	10	11	11	11	11	11	12	11	11	11	11	11	10
5. Other Latin Alphabet	$\bar{X}$	16.3	16.2	25.2	34.1	41.9	50.3	23.7	23.5	31.4	31.7	22.9	22.5	54.3	54.1	78.2	77.5	120.4	127.8
	σ	5.9	6.1	8.0	11.1	12.1	16.0	6.5	5.9	6.4	9.5	6.8	8.7	11.8	16.9	17.3	21.9	26.2	36.3
	N	50	51	48	51	48	51	50	51	51	51	51	50	51	50	50	50	48	50
6. Chinese	$\bar{X}$	15.0	14.9	24.3	32.6	40.1	47.5	24.0	24.7	31.2	33.7	22.4	25.6	53.7	60.0	77.7	85.6	120.1	133.1
	σ	4.6	6.9	7.5	11.2	10.5	16.2	5.7	5.5	6.1	7.1	6.2	7.8	10.4	12.5	15.2	16.5	20.8	29.2
	N	140	176	150	176	139	175	165	210	167	209	167	175	166	174	164	174	137	173
7. Other	$\bar{X}$	15.6	14.4	24.1	31.4	40.1	45.9	22.0	21.7	28.7	31.2	20.9	20.9	49.7	52.3	71.9	74.2	112.0	120.4
	σ	4.9	4.8	8.1	10.6	10.9	14.2	6.0	6.2	6.9	8.2	6.1	7.7	11.1	14.2	16.2	18.9	24.7	30.5
	N	148	188	157	187	148	186	158	193	170	190	157	184	157	183	156	183	147	182
8. Unknown	N	69	41	63	40	52	40	138	41	128	42	133	40	133	40	133	39	44	39
LM-LEP TOTAL	$\bar{X}$	15.2	14.0	21.2	27.6	36.7	41.8	20.5	18.4	27.1	27.2	20.6	18.2	47.8	45.8	68.5	64.6	106.0	107.3
	σ	4.7	5.3	8.4	10.4	11.3	14.1	6.0	6.2	7.3	9.0	6.1	7.7	11.6	14.9	16.4	19.9	24.4	30.8
	N	2730	2816	2795	2880	2627	2705	3068	3248	3137	3333	3060	2889	3029	2846	2972	2760	2525	2565
B. EP/LIS	$\bar{X}$	21.3	19.4	28.8	36.4	50.4	55.9	24.0	21.5	28.6	28.0	24.6	22.2	53.2	50.6	77.5	72.3	128.1	129.0
	σ	6.0	6.5	8.4	12.3	13.0	17.4	5.7	6.0	7.1	8.8	5.9	8.1	11.5	15.2	16.1	19.8	26.5	34.1
	N	657	704	670	712	629	689	679	710	686	710	692	696	679	679	665	665	616	649
C. EP/Comp	$\bar{X}$	22.1	20.0	28.3	37.4	50.2	57.6	23.3	20.8	27.1	27.3	23.3	21.5	50.4	49.0	73.8	70.3	123.9	128.3
	σ	5.5	6.4	8.0	11.8	12.0	16.7	5.9	6.1	7.7	9.3	6.3	8.5	12.8	15.7	17.8	20.5	27.6	34.7
	N	359	411	370	410	354	396	371	419	372	417	366	412	365	402	364	396	348	385

TABLE 8.2a. Means and standard deviations for SAT Primary 1 Form F (Spring '85): Cohort A, Grade 1, Rights scores

Native Language		ENGLISH		MATHEMATICS		
		Vocab.	Reading Comprehension	Concepts of Number	Computation + Applic.	Math Total
A. LM-LEP						
1. Spanish	$\bar{X}$	18.0	19.8	19.7	27.0	47.1
	σ	6.2	9.6	6.5	8.7	14.1
	N	2252	2245	3172	3032	2936
2. Other Romance Languages	$\bar{X}$	18.8	22.2	20.5	28.4	49.5
	σ	5.4	10.2	6.8	8.9	13.7
	N	85	85	91	90	88
3. Other European	$\bar{X}$	21.6	26.2	22.9	28.9	51.7
	σ	7.1	9.6	5.7	8.2	13.4
	N	8	8	27	27	27
4. Native American	$\bar{X}$					
	σ					
	N	0	0	0	0	0
5. Other Latin Alphabet	$\bar{X}$	20.1	25.5	22.9	33.0	56.5
	σ	5.4	11.3	6.2	7.3	12.7
	N	59	61	72	65	64
6. Chinese	$\bar{X}$	18.5	26.3	23.5	324	56.5
	σ	5.3	9.9	5.9	8.0	13.5
	N	88	114	143	88	88
7. Other	$\bar{X}$	18.6	24.6	21.4	29.1	50.6
	σ	5.1	9.8	5.9	8.1	13.1
	N	214	214	221	219	218
8. Unknown	N	70	70	73	74	70
LM-LEP Total	$\bar{X}$	18.2	20.8	20.0	27.5	47.8
	σ	6.1	10.0	6.5	8.7	14.1
	N	2776	2797	3799	3595	3491
B. EP/LIS	$\bar{X}$	22.2	25.0	22.4	29.9	52.7
	σ	6.4	10.1	6.4	9.0	14.5
	N	672	652	715	657	643
C. EP/Comp.	$\bar{X}$	22.2	26.5	21.5	28.6	50.4
	σ	6.4	10.3	6.0	8.6	13.5
	N	389	404	402	390	384

TABLE 8.2b. Means and standard deviations for SAT Primary 2 Form E (Fall '84) and SAT Primary 3 Form F (Spring '85): Cohort B, Grade 3, Rights scores

Native Language		ENGLISH				MATHEMATICS							
		Vocab.		Reading Comprehension		Concepts of Number		Computation		Applications		Math Total	
		Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
A. LM-LEP													
1. Spanish	X̄	14.8	13.6	20.0	25.3	19.9	17.4	26.1	25.9	20.1	17.0	66.6	61.1
	σ	4.7	5.2	8.8	10.7	6.1	6.0	7.8	9.3	6.1	7.5	16.4	19.4
	N	2256	2259	2307	2324	2490	2648	2555	2736	2485	2338	2403	2220
2. Other Romance Language	X̄	18.2	16.4	22.4	28.7	21.6	20.2	26.8	27.2	20.6	17.5	69.7	65.2
	σ	7.9	6.9	9.1	12.8	7.4	6.8	6.8	7.8	8.6	8.6	20.5	20.9
	N	39	71	41	72	39	72	40	73	39	70	38	69
3. Other European	X̄	18.7	13.2	24.8	27.6	19.8	19.5	30.4	29.1	21.0	19.8	70.5	70.8
	σ	5.6	6.4	10.5	12.9	6.6	7.8	9.4	10.6	7.7	9.0	22.3	21.9
	N	17	19	18	19	17	22	19	21	17	20	17	20
4. Native American	X̄	19.0	15.4	22.9	30.9	22.5	15.8	28.9	25.4	24.5	15.2	75.9	55.5
	σ	2.8	4.6	8.9	12.1	5.0	5.7	7.5	10.4	6.2	5.9	17.7	17.0
	N	11	11	11	11	11	11	11	11	11	12	11	11
5. Other Latin Alphab.	X̄	16.2	16.2	24.6	32.9	23.6	23.5	31.2	31.4	22.8	22.4	77.9	77.0
	σ	6.0	6.1	8.7	12.0	6.7	6.0	6.7	10.1	6.9	8.8	17.8	22.6
	N	50	51	48	51	50	51	51	51	51	50	50	50
6. Chinese	X̄	15.0	14.8	23.5	31.4	23.9	24.6	30.8	33.5	22.3	25.6	77.0	85.3
	σ	4.6	6.9	8.2	11.8	5.8	5.8	6.6	7.7	6.4	7.9	15.8	16.7
	N	140	176	150	176	165	210	167	209	167	175	164	174
7. Other	X̄	15.2	14.4	23.3	30.2	21.9	21.7	28.4	30.9	20.8	20.7	71.5	73.7
	σ	5.2	4.9	9.1	11.2	6.0	6.2	7.3	8.6	6.2	7.9	16.5	19.3
	N	148	188	157	187	158	193	170	190	157	184	156	183
8. Unknown	N	69	41	63	40	138	41	133	42	129	40	133	39
LM-LEP Total	X̄	14.9	13.9	20.6	26.3	20.4	18.3	26.7	26.8	20.4	17.9	67.9	63.9
	σ	4.9	5.4	8.9	11.1	6.2	6.4	7.8	9.4	6.3	7.9	16.9	20.4
	N	2730	2816	2795	2880	3068	3248	3146	3333	3060	2889	2972	2766
B. EP/LIS	X̄	21.3	19.3	28.4	35.3	23.9	21.4	28.3	27.5	24.4	22.0	77.0	71.6
	σ	6.1	6.5	8.9	13.1	5.9	6.1	7.6	9.3	6.1	8.3	16.6	20.3
	N	657	704	670	712	679	710	686	710	692	696	665	665
C. EP/Comp.	X̄	21.9	19.8	27.9	37.4	23.1	20.7	26.6	26.9	23.1	21.2	72.9	69.6
	σ	5.7	6.6	8.5	12.4	6.1	6.1	8.3	9.8	6.5	8.6	18.6	20.9
	N	359	411	370	410	371	419	372	417	366	412	364	396

third-grade cohort, Cohort B, was tested twice during the first year (the Primary 2 battery in the fall and Primary 3 in the spring), and that the first-grade cohort, Cohort A, was tested once (in the spring, with the Primary 1 battery).

8A.1 SCORE DISTRIBUTIONS AND RELATED DATA

Basic distributional data on the SAT subtests are shown in Appendix E for adjusted scores[1]. Examination of these distributions[2] shows that the scores on all tests, in both grades, are spread out well, covering a wide range, and that they are not conspicuously bunched at either end. This is true not only for the LM-LEP students but also for the two English-proficient groups. These data provide evidence that the levels of the SAT chosen for this study are appropriate. Means and standard deviations for adjusted SAT scores, for all groups, are summarized in Table 8.1a (for Cohort A), and 8.1b (for Cohort B). (Tables 8.2a and 8.2b provide corresponding data for rights scores.)

Table E.3 shows the test publisher's percentiles (based on a national sample, not a LM-LEP sample) corresponding to the mean rights score and to points one standard deviation above and one standard deviation below the mean.[3] This table, which shows how the three groups (LM-LEP, EP/LIS and EP/Comp) compare with the national percentile norms for rights scores on the SAT, indicates that the LM-LEP students scored systematically lower than the other two groups. The disparity was much greater in the English tests (vocabulary and reading comprehension) than in math. The only math section on which the LM-LEP students did about as well as the English-proficient groups was computation; this is the set of items which, as indicated in Table 8.3, makes virtually no demands on the student with respect to knowledge of English.

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[1] All data reported on the SAT in this and subsequent chapters, except where otherwise explicitly stated, use "adjusted scores" rather than "rights scores". The distinction between these two types of scores, and our reasons for preferring the former, are described in Chapter 2, Section 2H.1. Appendix E contains some technical data about the SAT, including data on the relationship between the "rights" and "adjusted" scores.

[2] Appendix table E.1 shows the distributions of adjusted scores for Cohort A (grade 1) in the spring of 1985, for all three basic groups (LM-LEP, EP/LIS, and EP/Comp). Tables E.2 shows the corresponding data for Cohort B (grade 3).

[3] In a normal distribution one standard deviation above the mean is the 84th percentile and one standard deviation below is the 16th percentile.

As for the magnitude of the LM-LEP students' departure from national norms, their mean Vocabulary scores were at the 22nd, 7th, and 14th percentiles (Grade 1, Grade 3 fall, and Grade 3 spring respectively). The corresponding figures for Reading Comprehension were 25th, 15th, and 21st percentiles; for the Math Total they were at the 27th, 30th and 35th percentiles. As for the three parts of the Math test, the three Concepts of Number percentiles corresponding to the means were 22nd, 28th and 32nd. For Computation and Applications combined, separate norms are not available for the battery given in grade 1; for the combination, the mean is at the 28th percentile. Separate Computation and Applications norms are available for the batteries used in grade 3; the Fall and Spring Computation means are at the 44th and 37th percentiles respectively; the corresponding Applications percentiles are 25th and 29th.

If the percentiles for the Vocabulary, Reading Comprehension, and Math Total means are averaged (for grade 1, grade 3 Fall, and grade 3 Spring), the resulting average of the nine national percentiles for the nine means is only 22. The averages of the corresponding nine percentiles one standard deviation above the mean (which is 84 in an unselected, normally distributed population) and one standard deviation below (which is 16 in the same normal population) are only 46 and 6 respectively. Thus the LM-LEP students' scores in this first year of the study are very low in comparison with national norms.

As Tables 8.1a and 8.1b (and also Tables 8.2a and 8.2b) show, the LM-LEP students scored substantially lower than either of the English-proficient groups (EP/LIS and EP/Comp) on the two English tests. The LM-LEP means are at the 11th to 24th percentiles, while the percentiles corresponding to EP/LIS and EP/Comp means are in the 30's and 40's. (Thus the EP/LIS and EP/Comp groups, too, are well below national norms. This confirms that the use of a comparison group from the same schools as the LM-LEP children is definitely better than the alternative--depending solely on the national norms to serve the comparison group function--would have been.) Column 6 of Table 8.2c provides the relevant summary data.

As for the math test, the three parts have to be considered separately because they make different demands on ability to comprehend English. Furthermore, the demands made by the Primary 3 math test (given to grade 3) differ from those made by Primary 1 (given to grade 1). Table 8.3 summarizes the English requirements of the math test not only for the three batteries already given but for two additional batteries (Intermediate 1 and Intermediate 2) scheduled to be given to Cohort B at the end of Year 2 and Year 3 respectively. The parts of the table that apply to the tests given in Year 1 are enclosed in boxes.

The results, which are summarized in Columns 7-11 of Table 8.2c, are in line with what would be suggested by Table 8.3. In grade 1 (Cohort A) the LM-LEP students were almost on a par with the two English-proficient groups in Computation plus Applications, and slightly lower in Concepts of Number. The Cohort B students, who, it will be recalled from Chapter 4, are expected to be on the average a little lower than Cohort A in academic ability, were still holding their own in Computation in comparison with the two English-proficient groups. However, they were substantially lower in both Concepts of Number and Applications. These are the two math tests which, as indicated by Table 8.3, require some knowledge of spoken English, and in the case of the Applications test also require a reading knowledge of English. Overall, the differences between the LM-LEP group and the two English-proficient groups were considerably smaller for math than for English, as can be seen from an examination of columns 6 and 7 of Table 8.2c.

In addition to showing overall data for the three basic groups (LM-LEP, EP/LIS, and EP/comp), Tables 8.1a and 8.1b also break the LM-LEP data down by native language category, as do Tables 8.2a and 8.2b. If we look at these data, we see that the language groups differed substantially in their mean scores on Vocabulary and Reading Comprehension. Many of the differences were almost certainly due to differences among the various ethnic groups with respect to the degree to which the parents, and the children, perceive pressure to learn English. A related factor may be that

TABLE 8.2c. SAT percentiles corresponding to SAT math mean scores[a] and mean of SAT percentiles corresponding to means of English score[a,b,c]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
							Math subtests			
Cohort	Grade	Data Collection Period	SAT Battery	Group	English scores[b] Mean %ile	Math Total %ile	Concepts of no. %ile	Comput. %ile	Applic. %ile	Comput. + applic. %ile
A	1	Spring '85	Primary 1	LM-LEP	24	27	22	--	--	28
				EP/LIS	37	35	33	--	--	35
				EP/Comp	40	31	28	--	--	31
B	3	Fall '84	Primary 2	LM-LEP	11	30	28	44	25	--
				EP/LIS	30	45	43	50	44	--
				EP/Comp	30	38	39	43	38	--
B	3	Spring '85	Primary 3	LM-LEP	18	35	32	37	29	--
				EP/LIS	36	45	47	40	42	--
				EP/Comp	40	42	44	38	40	--

[a] Rights score.

[b] The two English scores are Vocabulary and Reading Comprehension. The percentiles corresponding to the Vocabulary mean and the Reading Comprehension mean have been averaged to give the mean percentiles in column 6.

[c] This table is based on the Table E.3 data (in Appendix E).

TABLE 8.3. Degree to which SAT math tests require ability to comprehend English*

SAT Battery	Given in Year 1 to:	Scheduled to be given to:	SAT Math Test	Demands on ability to comprehend	
				Spoken English	Written English
Primary 1	Cohort A, Grade 1, Spring '85		Computation	Almost none	None
			Concepts of No.	Considerable	Almost none
			Applications	Considerable	Almost none
Primary 2	Cohort B, Grade 3, Fall '84	Cohort A, Grade 2, Spring '86	Computation	Almost none	None
			Concepts of No.	Some	Almost none
			Applications	Some	Very little
Primary 3	Cohort B, Grade 3, Spring '85	Cohort B, Grade 3, Spring '87	Computation	Almost none	None
			Concepts of No.	Some	Almost none
			Applications	Some	Considerable
Intermediate 1		Cohort B, Grade 4, Spring '86	Computation	Almost none	Slight
			Concepts of No.	Some	Considerable
			Applications	Some	Considerable
Intermediate 2		Cohort B, Grade 5, Spring '87	Computation	Almost none	Slight
			Concepts of No.	Some	Considerable
			Applications	Some	Considerable

*The parts of this table that apply to the tests given in Year 1 are enclosed in boxes.

members of some ethnic groups are more likely to live in enclaves where everyone speaks the native language.

Looked at from another viewpoint, although many of the mean differences among language groups are statistically significant there were very large overlaps among the groups, as can be seen from the sizable standard deviations (shown in Tables 8.1a and 8.1b, or 8.2a and 8.2b). Thus some of the mean differences that are statistically significant are nevertheless numerically too small to suggest that the basic conclusions of the study will necessarily differ by language group.

Another approach to the relation of SAT scores and language is to investigate the relation to SAT scores of how well English and the native language are spoken. Table 8.4 presents some data of that sort. The table shows means and standard deviations on selected SAT tests (and the Raven) for groups that are somewhat homogeneous with respect to their English SOPR and native language SOPR scores, for each of which the range of possible scores (5 to 25) has been divided into three equal intervals. The SAT tests selected for inclusion in this table were the two English tests (Vocabulary and Reading Comprehension), Math Total, and because it could be expected to show the least relation to SOPR scores, Computation. The Computation test lived up to expectation. In general, scores on the other tests were much more closely related to scores on the English SOPR than to the native language SOPR. In fact, some tendency towards a negative relation between native language SOPR and SAT Vocabulary (for students falling in the same class interval on English SOPR) was manifest. The reason for this negative relationship is not entirely clear at this point.

8A.2 CORRELATIONAL DATA

Sections of two large correlation tables which appear in Appendix E (Tables E.4a for Cohort A and E.4b for Cohort B) have been extracted and put in this chapter for the convenience of the reader, at the points where those sections are discussed. These tables contain the Raven total, all SAT scores, all English SOPR scores, teacher ratings on selected academic skills variables (five in English and three in math) and three composites relating to the student's home and family.

Table 8.4. Adjusted score means and standard deviations on selected tests, for groups classified on SOPR scores

SOPR Total scores			Cohort A, Spring '85 Grade 1				Cohort B, Fall '84 Grade 3				Cohort B, Spring '85 Grade 3				Cohort A Grade 1	Cohort B Grade 3	
			SAT Primary 1 Form F				SAT Primary 2 Form F				SAT Primary 3 Form F				Raven *		
				Rdg.	Math			Rdg.	Math			Rdg.	Math				
Native language	English		Vocab.	Comp.	Comput.	Total	Vocab.	Comp.	Comput.	Total	Vocab.	Comp.	Comput.	Total	CPM	SPM	Row #
19-25	19-25	$\bar{X}$	19.8	25.1	16.0	54.3	16.2	24.6	28.5	73.5	15.1	30.7	28.6	68.6	19.4	26.2	1
		σ	4.9	8.4	4.7	12.3	4.5	7.7	6.6	14.8	5.2	10.2	8.5	18.7	5.8	8.9	2
		N	531	534	682	625	840	865	913	889	798	827	916	799	810	810	3
	12-18	$\bar{X}$	17.9	21.4	14.9	49.4	13.6	19.1	26.8	66.4	12.2	24.7	26.4	61.8	18.7	25.0	4
		σ	5.1	7.5	4.7	12.2	3.7	7.3	7.1	14.7	3.9	8.3	8.7	18.4	5.6	9.1	5
		N	461	463	713	627	699	699	767	732	612	633	793	614	895	744	6
	5-11	$\bar{X}$	15.8	19.6	13.9	45.2	12.5	13.6	25.1	60.4	11.2	20.1	26.4	59.7	17.6	24.0	7
		σ	4.4	7.3	5.0	13.4	3.8	5.1	8.0	16.6	4.0	6.4	9.3	18.2	5.6	9.7	8
		N	443	446	783	692	223	249	341	288	214	220	319	215	980	355	9
12-18	19-25	$\bar{X}$	21.4	25.2	14.8	52.0	18.3	24.7	26.4	69.9	17.0	31.0	27.0	65.6	18.5	25.7	10
		σ	5.2	8.7	4.6	12.4	5.5	8.0	7.4	17.5	6.5	11.5	8.8	20.1	5.6	9.2	11
		N	100	101	115	108	138	142	144	141	130	131	135	123	126	135	12
	12-18	$\bar{X}$	17.7	20.4	13.1	45.6	14.6	17.6	25.5	63.6	13.1	23.4	24.1	54.7	17.4	21.7	13
		σ	5.9	7.5	5.0	12.6	4.5	7.6	7.6	16.8	4.8	8.7	9.5	18.5	5.3	7.9	14
		N	152	151	216	199	125	123	134	124	109	109	130	101	248	134	15
	5-11	$\bar{X}$	18.3	19.8	13.4	45.6	13.5	133	21.5	52.8	10.9	19.7	22.0	47.2	16.3	19.9	16
		σ	6.8	7.1	4.9	13.7	3.2	5.7	8.6	15.9	3.4	6.7	10.2	19.1	5.6	6.6	17
		N	128	127	180	157	48	50	76	59	39	37	64	42	220	69	18
5-11	19-25	$\bar{X}$	23.6	26.8	14.9	52.7	19.7	26.4	27.8	72.8	18.9	33.9	27.5	69.5	19.2	24.9	19
		σ	5.6	8.6	4.7	12.3	5.8	7.2	6.5	15.6	6.3	10.7	8.4	18.5	5.5	8.9	20
		N	133	133	138	135	81	84	82	81	74	73	76	73	145	79	21
	12-18	$\bar{X}$	17.4	18.9	11.1	37.7	16.2	19.2	27.4	67.4	14.7	24.1	23.6	56.3	15.7	24.3	22
		σ	6.3	6.2	4.8	12.2	5.0	8.1	6.6	14.8	5.8	8.9	8.0	18.4	5.3	8.4	23
		N	37	37	42	39	49	50	47	46	47	49	49	47	50	49	24
	5-11	$\bar{X}$	17.2	19.7	10.8	39.2	13.5	14.5	23.2	56.0	11.0	20.4	24.5	53.5	14.7	21.1	25
		σ	6.9	7.8	5.3	14.8	3.7	5.6	7.9	15.6	2.9	6.2	9.1	18.8	5.3	7.4	26
		N	58	63	97	89	32	34	35	34	26	31	33	26	116	36	27

*These data are discussed in Chapter 4, Section C, where they are also shown in Table 4.17.

8A.2.a SAT Intercorrelations, Cross-correlations, and Correlations with Raven

Tables 8.5a (Cohort A) and 8.5b (Cohort B) (extracted from Tables E.4a and E.4b) show the intercorrelations among the various SAT scores, and their correlation with the Raven. The Raven had modest correlations with all the SAT variables. Its highest correlation, in both cohorts, was with the Math Total (.47 in Cohort A, .46 in Cohort B fall testing, .48 in Cohort B spring testing). Its correlations with the individual math scores were also higher than with the individual English scores. The correlations are in line with expectation, and may be regarded as evidence supporting the choice of both the SAT and the Raven as mainstays of the study. The kinds of correlational relationships expected between Raven and SAT are discussed at some length in Chapter 4, Section D; the discussion will not be repeated here.

Table 8.6 shows the cross-correlations between the fall '84 SAT and the spring '85 SAT (for Cohort B). In most cases the highest correlation for any variable was with its matching variable in the other battery. (The exceptions occurred with a composite score in which the directly corresponding score is included.) The cross-correlation for English total was .76; for math total, .75. The lowest of the nine cross-correlations, .56, was for vocabulary.

8A.2.b Correlations Between SOPR Scales and SAT Scores

Table 8.7a, extracted from Tables E.4a and E.4b, shows the cross-correlations between English SOPR ratings and SAT scores. Most of the correlations between SOPR total and SAT scores were in the .20's for Cohort A and in the .30's and .40's for Cohort B. The chief exception was Computation, for which the three correlations (Cohort A, Cohort B fall, and Cohort B spring) with SOPR total were .15, .17, and .15 respectively. The grade 3 (Cohort B) correlations of the English scores with SOPR were systematically higher than the math correlations with it; the highest correlation, .465, was for English total (spring 1985, Cohort B).

TABLE 8.5a. Intercorrelations among SAT scores and Raven: Cohort A, Grade 1*

Based on LM-LEP students

Row #	SCORE	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Stanford Achievement Test - Primary 1 - Spr.'85								
		ENGLISH			MATH					Total
		Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math
		CORRELATION COEFFICIENTS								
1	Raven CPM	.242	.351	.350	.438	.359	.430	.443	.469	.455
	SAT-Primary 1 -- Spring '85									
	English									
2	Vocabulary		.524	.815	.486	.317	.513	.461	.502	.723
3	Rdg.Comprehension			.921	.568	.423	.540	.540	.595	.833
4	English Total				.622	.434	.603	.578	.635	.898
	Math									
5	Concepts of No.					.618	.736	.760	.916	.855
6	Computation						.565	.902	.833	.707
7	Applications							.866	.864	.815
8	Comput.+Applic.								.957	.855
9	Math Total									.910
	English + Math									
10	Total									

*Correlations in this table have been extracted from Table E.4a.

TABLE 8.5b. Intercorrelations among SAT scores and Raven: Cohort B, Grade 3*

Based on LM-LEP students

	Stanford Achievement Test - Primary 2 - Fall'84									Stanford Achievement Test - Primary 3 - Spr.'85								
	ENGLISH			MATH					Total	ENGLISH			MATH					Total
TEST	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math
	CORRELATION COEFFICIENTS																	
Raven SPM	.202	.346	.338	.452	.350	.386	.422	.462	.463	.186	.337	.322	.482	.352	.432	.435	.479	.461
SAT																		
English																		
Vocabulary		.461	.766	.380	.170	.463	.354	.387	.613		.527	.776	.390	.178	.407	.318	.361	.598
Rdg.Comp.			.924	.523	.350	.516	.493	.536	.786			.945	.536	.434	.642	.593	.614	.840
English Total				.543	.327	.574	.510	.556	.834				.548	.390	.633	.563	.595	.853
Math																		
Concepts of No.					.572	.709	.732	.880	.836					.597	.689	.715	.853	.809
Computation						.507	.886	.830	.703						.597	.909	.889	.746
Applications							.849	.854	.834							.877	.875	.863
Comput.+Appli								.968	.880								.975	.895
Math Total									.922									.927
English + Math Total																		

*Correlations in this table have been extracted from Table E.4b.

TABLE 8.6. Correlations between fall '84 and spring '85 SAT scores: Cohort B, Grade 3*

Based on LM-LEP students

SAT Primary 2 Fall '84: SAT score	Stanford Achievement Test - Primary 3 - Spr. '85								
	ENGLISH			MATH					Total
	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math
	CORRELATION COEFFICIENTS								
English									
Vocabulary	.561	.471	.566	.325	.151	.338	.266	.302	.460
Rdg.Comp.	.440	.727	.708	.495	.372	.559	.513	.544	.682
English Total	.561	.730	.758	.499	.335	.551	.487	.523	.693
Math									
Concepts of No.	.357	.495	.505	.677	.500	.574	.598	.662	.666
Computation	.138	.351	.314	.537	.628	.493	.632	.643	.564
Applications	.450	.508	.550	.595	.433	.582	.562	.609	.652
Comput.+Applic.	.327	.489	.488	.649	.618	.615	.690	.722	.697
Math Total	.360	.524	.527	.703	.616	.641	.702	.748	.732
English + Math									
Total	.500	.687	.702	.698	.564	.682	.692	.740	.808

*Correlations in this table have been extracted from Table E.4b.

Table 8.7b is essentially parallel[1] to Table 8.7a, except that it is for the native language SOPR not the English SOPR. For both grade 1 and grade 3, correlations of the native language SOPR with the English subtest scores (particularly with Vocabulary) are significantly negative. The grade 1 correlations with Reading are also negative, but only very slightly (though the negative correlation, with Speaking is statistically significant). In grade 3 the correlations with Reading are not significantly different from zero, but the correlations with Vocabulary are again definitely negative. The correlations with the Math scores are quite close to zero for the grade 1 cohort and also for grade 3 in the fall, but by the spring they are a little higher.

8A.2.c Correlations of SAT with the Three Home-and-Family Variables

Table 8.8a shows the cross-correlations between the SAT variables and three home-and-family variables:

1. Parents' use of English in the home.

   This is a five-point scale from 0 to 4 in which a value of 4 means the parents speak nothing but English and 0 means the parents speak no English.

2. Parents' education.

   This is a weighted average of the number of years of schooling the parents have had, with a scale value of 14 representing 14 or more years and with the more educated parent having triple weight.

3. Socioeconomic status.

   This is a weighted sum of parents' education (with the parents equally weighted) and status of parent's occupation (on a five-point scale). If both parents are employed the higher-status occupation is the one used (See Appendix B for further details).

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[1] Table 8.7b, unlike Table 8.7a, shows means and standard deviations in addition to the correlation coefficients. The means and standard deviations for the Table 8.7a variables can be found in Tables E.4a and E.4b, from which the Table 8.7a correlations were extracted.

TABLE 8.7a. Correlations between English SOPR ratings and SAT scores

Based on LM-LEP students*

Cohort	Grade	N	SAT Battery, Form, and When Administered	SAT Score	English SOPR						
					Total	Comprehension	Speaking	Fluency	Vocabulary	Pronunciation	Grammar
					CORRELATIONS						
A	1	1550	Primary 1	English							
			Form F,	Vocabulary	.267	.236	.269	.277	.258	.227	.265
			Spring '85	Rdg.Comprehension	.255	.255	.249	.266	.238	.209	.237
				English Total	.296	.282	.292	.308	.280	.246	.283
				Math							
				Concepts of No.	.209	.204	.205	.216	.191	.176	.201
				Computation	.154	.171	.147	.153	.142	.125	.141
				Applications	.274	.265	.270	.272	.262	.236	.260
				Comput.+Applic.	.237	.243	.230	.235	.223	.199	.222
				Math Total	.240	.241	.234	.241	.223	.202	.227
				English + Math							
				Total	.295	.288	.290	.302	.277	.247	.281
B	3	1434	Primary 2	English							
			Form E,	Vocabulary	.396	.329	.400	.384	.386	.359	.372
			Fall '84	Rdg.Comprehension	.471	.419	.469	.451	.450	.414	.446
				English Total	.512	.446	.512	.492	.493	.455	.484
				Math							
				Concepts of No.	.312	.282	.309	.296	.289	.279	.289
				Computation	.176	.175	.170	.155	.161	.154	.168
				Applications	.388	.345	.386	.363	.365	.361	.362
				Comput.+Applic.	.317	.293	.312	.290	.295	.289	.298
				Math Total	.336	.308	.332	.312	.313	.305	.318
				English + Math							
				Total	.461	.412	.459	.436	.437	.414	.436
B	3	1434	Primary 3	English							
			Form F	Vocabulary	.376	.327	.376	.370	.354	.324	.365
			Spring '85	Rdg.Comprehension	.431	.373	.432	.420	.410	.380	.414
				English Total	.465	.402	.466	.454	.441	.407	.448
				Math							
				Concepts of No.	.261	.230	.261	.259	.231	.238	.252
				Computation	.142	.127	.141	.135	.131	.120	.146
				Applications	.257	.230	.256	.246	.230	.237	.248
				Comput.+Applic.	.219	.195	.218	.209	.198	.195	.216
				Math Total	.247	.219	.246	.238	.222	.221	.242
				English + Math							
				Total	.377	.330	.377	.367	.350	.334	.366

*Correlations in this table have been extracted from Tables E.4a. and E.4b.

TABLE 8.7b. Correlations between native language SOPR ratings and SAT scores

Based on LM-LEP students

Cohort	Grade	N	SAT Battery, Form, and When Admin.	SAT Score	Native Language SOPR								
					Total	Comprehension	Speaking	Fluency	Vocabulary	Pronunciation	Grammar	Mean	σ
					CORRELATIONS								
A	1	1827	Primary 1 Form F Spring '85	English									
				Vocabulary	-.187	-.164	-.188	-.168	-.186	-.174	-.182	18.66	5.67
				Rdg.Comp.	-.051	-.017	-.058	-.038	-.054	-.064	-.064	22.39	8.27
				English Total	-.121	-.088	-.126	-.103	-.122	-.123	-.128	41.05	12.27
				Math									
				Concepts of No.	.077	.085	.073	.086	.078	.026	.084	20.85	5.93
				Computation	.123	.122	.120	.132	.116	.086	.118	14.71	4.94
				Applications	-.005	.012	-.009	.015	-.009	-.038	-.002	13.67	4.30
				Comput. + Applic.	.072	.081	.068	.088	.065	.032	.071	28.38	8.13
				Math Total	.079	.088	.075	.093	.075	.031	.081	49.23	13.24
				English + Math Total	-.019	.004	-.024	-.002	-.022	-.048	-.021	90.28	23.05
B	3	1514	Primary 2 Form E Fall '84	English									
				Vocabulary	-.192	-.186	-.189	-.192	-.189	-.187	-.148	15.40	4.78
				Rdg.Comp.	.032	.011	.036	.023	.024	.038	.049	22.33	8.21
				English Total	-.059	-.071	-.055	-.066	-.063	-.052	-.027	37.73	11.16
				Math									
				Concepts of No.	.101	.073	.106	.099	.097	.098	.106	21.11	5.94
				Computation	.121	.111	.120	.118	.112	.093	.133	27.94	6.90
				Applications	.011	.000	.014	.012	.010	.014	.016	21.08	6.04
				Comput. + Applic.	.081	.068	.082	.080	.074	.065	.091	49.02	11.21
				Math Total	.094	.075	.096	.092	.088	.082	.103	70.13	16.05
				English + Math Total	.035	.017	.039	.031	.029	.030	.056	107.86	24.10
B	3	1514	Primary 3 Form F Spring '85	English									
				Vocabulary	-.129	-.128	-.126	-.122	-.122	-.134	-.101	14.13	5.28
				Rdg.Comp.	.003	-.018	.008	-.001	.003	.000	.029	27.83	10.21
				English Total	-.047	-.062	-.042	-.048	-.044	-.052	-.017	41.95	13.75
				Math									
				Concepts of No.	.097	.075	.099	.101	.100	.090	.086	18.82	6.23
				Computation	.155	.135	.156	.166	.150	.153	.123	28.02	8.83
				Applications	.099	.066	.104	.100	.100	.095	.102	18.57	7.43
				Comput. + Applic.	.144	.115	.148	.151	.142	.141	.126	46.59	14.58
				Math Total	.139	.110	.142	.145	.138	.134	.122	65.41	19.49
				English + Math Total	.069	.044	.074	.073	.070	.064	.072	107.36	29.67
					MEANS and SDs								
A	1	Mean			20.11	4.12	15.98	3.95	3.97	4.15	3.92		
		σ			5.66	1.12	4.63	1.25	1.22	1.19	1.25		
B	3	Mean			21.08	4.32	16.76	4.20	4.18	4.29	4.08		
		σ			4.99	1.00	4.10	1.07	1.07	1.08	1.10		

TABLE 8.8a. Correlation of three home-and-family variables with SAT scores

Based on LM-LEP students*

SAT score	Cohort A, Grade 1			Cohort B, Grade 3					
	Correlation with SAT, Spring '85			Correlation with					
				SAT, Fall '84			SAT, Spring '85		
	Parent's Use of English	Parents' Education	SES	Parents' Use of English	Parents' Education	SES	Parents' Use of English	Parents' Education	SES
English									
Vocabulary	.158	.191	.215	.260	.239	.271	.231	.198	.208
Rdg.Comp.	.091	.126	.150	.114	.165	.201	.140	.138	.184
English Total	.134	.172	.200	.195	.223	.262	.194	.179	.216
Math									
Concepts of No.	-.008	.080	.082	.002	.067	.061	.016	.070	.100
Computation	-.068	.037	.068	-.095	-.007	-.004	-.049	-.019	-.028
Applications	.046	.113	.142	.070	.114	.119	.006	.083	.086
Comput.+Applic.	-.017	.082	.115	-.021	.058	.063	-.026	.032	.029
Math Total	-.014	.086	.107	-.014	.065	.073	-.014	.046	.054
English + Math									
Total	.064	.142	.170	.082	.148	.174	.082	.115	.138

*Correlations in this table have been extracted from Tables E.4a and E.4b.

TABLE 8.8b. Cross-correlations of SAT summary scores with SES, three reading-matter-in-the-home variables, and time in the United States*

Based on LM-LEP students

				S.A.T. Summary Scores							
				Fall 1984			Spring 1985				
Cohort	Grade	N	Variable	Eng.	Math	Tot.	Eng.	Math	Tot.	Mean	S.D.
				CORRELATION COEFFICIENTS							
A	1	1011	1. Socioeconomic status				.251	.142	.215	14.91	5.35
			2. No. of years in United States				.077	-.002	.041	5.68	1.76
			3. Reading matter in the home								
			a. In English				.200	.029	.125	.99	.87
			b. In another language				-.062	.004	-.032	.56	.80
			c. All				.106	.024	.071	1.55	1.17
			Mean				43.24	51.02	94.26		
			S.D.				13.07	13.29	23.97		
				CORRELATION COEFFICIENTS							
B	3	699	1. Socioeconomic status	.254	.077	.172	.219	.056	.141	14.13	5.23
			2. No. of years in United States	.192	.040	.118	.125	-.085	.007	6.77	2.57
			3. Reading matter in the home								
			a. In English	.248	.091	.178	.234	.081	.164	.99	.87
			b. In another language	-.084	.049	-.008	-.053	.027	-.009	.61	.82
			c. All	.121	.097	.122	.131	.075	.111	1.59	1.22
			Mean	39.95	71.90	111.84	44.75	68.34	113.09		
			S.D.	11.78	16.42	24.82	14.86	19.39	30.69		

*Correlations in this table are based on the same cases as those in Table 4.18.

The most striking finding in the Table 8.8a data is that Vocabulary consistently had a higher correlation with each of the three home-and-family variables than did any other SAT score. The explanation of the relation to parents' use of English in the home is of course obvious, as is parental education; and since the latter is a component of socioeconomic status, that, too can be expected to be correlated with SAT Vocabulary.[1]

Table 8.8b shows the cross-correlations of SAT summary variables with socioeconomic status, length of time in the U.S. and three additional home-and-family variables--specifically the three variables relating to the presence of reading materials in the home discussed in Chapter 4, Section D. The subsamples on which the two tables (8.8a and 8.8b) are based are not identical.[2] Socioeconomic status is included in both tables, to provide a link, and thus a basis for comparison. Inspection of Table 8.8b reveals a definite relationship between the presence of English reading matter (newspapers or magazines) in the home and total English score on the SAT. It must be borne in mind, however, that this relationship is not necessarily a causative one; it may merely reflect the fact that both the presence of English reading matter in the home and level of the English score are attributable at least in part to some third variable to which both are related. We investigated the possibility that the explanation of the correlation lay in the fact that both the child's SAT English score and the likelihood of English reading matter in the home would tend to increase the longer the family lived in the United States. That possible explanation has been eliminated, however; the partial correlations between SAT English and

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[1] The intercorrelations of the three variables are shown in Tables E.4a and E.4b.

[2] The subsamples for the Table 8.8b data differ from those for Table 8.8a because the data in the two tables are extracted from different pairs of listwise correlation matrices. Table 8.8a is extracted from Tables E.4a and E.4b, while Table 8.8b is extracted from the same listwise matrix as Table 4.18.

English reading matter in the home, with length of time in the United States partialed out,[1] are about as high as the corresponding zero-order correlation, as can be seen from a comparison of columns 6 and 8 in Table 8.8c.

8B B. TEACHERS' RATINGS OF STUDENT PROFICIENCY IN ENGLISH, MATH, AND NATIVE LANGUAGE

On the Student Evaluation Form the academic subject teacher who spent the most time with a student (usually the student's homeroom teacher) was asked at the end of the school year to rate each student's proficiency in seven aspects of English, three of math, and three aspects of native language, on a five-point scale. The various proficiencies to be rated are listed below and in Table 8.9; the footnote of the table shows the five-point scale. These ratings are intended primarily as a supplement to the SAT scores. Some preliminary data involving the ratings are presented in the paragraphs that follow. The specific areas for which rating were obtained are:

For English

1. Pronunciation
2. Oral communication
3. Vocabulary
4. Spelling
5. Mechanics of reading
6. Reading comprehension
7. Writing

For Math

1. Concept of numbers
2. Computation
3. Word problems

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[1] "Partialing out" a variable (C) from a correlation between two other variables (A and B) means determining what the correlation between variables A and B would be if that portion of them dependent on C were first removed. The partial correlation between variables A and B, with C partialed out, is represented by the notation $r_{AB\cdot C}$.

TABLE 8.8c. Correlations between SAT English Total and English reading matter in the home, without and with time in the U.S. partialed out; also related correlations

(1) Cohort	(2) Grade	(3) SAT battery, form, and when administered	(4) N	(5) Variable	(6) Correlation* between SAT English and English reading matter in the home (r_{12})	(7) Correlation* with time in U.S. (r_{13} and r_{23})	(8) Partial correlation ($r_{12.3}$)
A	1	Primary 1 Form F Spring'85	1011	1. SAT English Total 2. English reading matter in the home 3. Time in U.S.	.200	.077 .136	.192
B	3	Primary 2 Form E Fall'84	699	1. SAT English Total 2. English reading matter in the home 3. Time in U.S.	.248	.192 .154	.225
B	3	Primary 3 Form F Spring'85	699	1. SAT English Total 2. English reading matter in the home 3. Time in U.S.	.234	.125 .154	.219

*These correlations have been extracted from the same listwise correlation matrices as Table 8.8b.

TABLE 8.9. Student skills to be rated on 5-point scale* (on Student Evaluation Form)

(1) Skills area	(2) Students to be rated in comparison with	(3) Students to be rated	(4) If and only if	(5) Skills to be rated
1. English	Average native English-speaking student of same age	All students	--	1a. Pronunciation 1b. Oral communication 1c. Vocabulary 1d. Spelling 1e. Mechanics of reading 1f. Reading comprehension 1g. Writing
2. Math	Average student of same age	All students	--	2a. Concept of numbers 2b. Computation (accuracy) 2c. Word problems
3. Native language	Average fully fluent child of same age	Students whose native language is not English	Teacher is proficient in child's native language	3a. Speaking 3b. Understanding 3c. Reading

*The 5-point scale for each of the 13 items shown in column 5 is as follows:

1. Much poorer
2. Somewhat poorer
3. About the same
4. Somewhat better
5. Much better

For Native Language

1. Speaking
2. Understanding spoken language
3. Reading

8B.1 DISTRIBUTIONAL DATA

Table 8.10 shows the distributions of the LM-LEP students' ratings, along with the means and standard deviations. Most of the means were low. The principal exceptions were two math ratings (Concepts of Number and Computation), corresponding to SAT math tests that require relatively little English, and two native language proficiency ratings--(1) Speaking, and (2) Understanding Speech--which were about 3.0 or slightly above.

8B.2 CORRELATIONAL DATA

8B.2.a Intercorrelations Among Student Evaluation Form Proficiency Scales, and Correlations with SAT Variables

Table 8.11 (extracted partly from Tables 9.4a and 9.4b respectively, in the next chapter, and partly from Tables E.4a and E.4b) shows the intercorrelations among various proficiency ratings for LM-LEP students, and also intercorrelations among the mean ratings in English, math, and native language proficiency.

Table 8.12 (extracted from Tables E.4a and E.4b) shows the correlations between selected Student Evaluation Form ratings and SAT scores. As in the case of the SOPR (see Chapter 4, Section C), we expected the correlation of ratings with SAT test scores to tell us more about the ratings than about the SAT. This expectation turned out to be correct. Again, as in the case of the SOPR, there was no tendency at all for the highest correlation of a particular SAT test to be with the corresponding rating scale. This supports the earlier assertion that most raters did not successfully accomplish the fine-tuning of ratings called for by separately named ratings.

TABLE 8.10. Distributions, means, and standard deviations for end-of-year ratings by teachers

Based on LM-LEP students

hort	Grade	Form 9 Item #	Skill Area	Percentage distributions of ratings by teachers								Total N	Data based on ratings 1-5		
				Low 1	2	3	4	High 5	Don't know	Not yet taught*	Total		$\bar{X}$	σ	N
			English												
A	1	B1a	Pronunciation	22.4	38.9	29.3	5.5	3.7	.2	—	100.0	4501	2.29	1.00	4492
		b	Oral commun.	24.5	39.0	27.0	5.4	4.0	.2	--	100.0	4501	2.25	1.01	4493
		c	Vocabulary	27.9	39.7	23.3	5.0	3.8	.2	--	100.0	4473	2.17	1.02	4463
		d	Spelling	20.8	23.8	20.8	5.0	3.4	.6	25.5	100.0	4457	2.27	1.08	3292
		e	Mechanics of rdg.	19.2	24.1	23.4	6.0	4.2	.3	22.8	100.0	4482	2.38	1.10	3447
		f	Rdg. comprehension	20.5	24.3	21.2	5.2	4.0	.3	24.5	100.0	4484	2.31	1.10	3370
		g	Writing	20.1	21.8	24.9	5.9	4.0	.4	22.8	100.0	4498	2.37	1.11	3455
			Math												
		C1a	Concept of nos.	6.5	16.7	52.0	13.3	9.2	1.7	.6	100.0	4568	3.02	.97	4464
		b	Computation	7.1	18.7	50.3	12.8	8.9	1.7	.6	100.0	4562	2.97	.99	4458
		c	Word problems	13.5	22.5	39.2	8.5	6.5	2.2	7.6	100.0	4556	2.69	1.06	4107
			Native language												
		D5a	Speaking	5.1	14.3	53.7	13.5	10.1	3.3	--	100.0	3404	3.09	.95	3293
		b	Understand speech	3.5	9.5	58.6	13.5	11.7	3.1	—	100.0	3405	3.21	.91	3298
		c	Reading	15.7	19.3	36.0	12.1	9.9	7.0	—	100.0	3396	2.80	1.18	3157
			English												
	3	B1a	Pronunciation	15.0	41.7	33.2	6.6	3.5	.1	—	100.0	3523	2.42	.94	3521
		b	Oral commun.	17.3	40.7	31.2	6.9	3.9	.0	—	100.0	3524	2.39	.98	3523
		c	Vocabulary	20.2	43.7	25.6	6.5	3.9	.0	--	100.0	3507	2.30	.99	3506
		d	Spelling	20.2	31.7	28.0	8.3	4.8	.0	6.9	100.0	3519	2.42	1.08	3275
		e	Mechanics of rdg.	16.3	36.0	29.0	7.6	4.5	.1	6.5	100.0	3520	2.44	1.02	3287
		f	Rdg. comprehension	18.4	37.6	25.7	7.3	4.4	.1	6.5	100.0	3526	2.38	1.03	3292
		g	Writing	23.3	33.6	25.7	7.4	4.2	.1	5.8	100.0	3521	2.32	1.07	3314
			Math												
		C1a	Concept of nos.	5.6	19.7	51.2	14.7	8.6	.2	.0	100.0	3540	3.01	.96	3532
		b	Computation	6.8	22.2	46.5	15.3	9.0	.2	.0	100.0	3543	2.98	1.00	3534
		c	Word problems	15.5	32.9	33.9	10.5	6.0	.4	.8	100.0	3539	2.58	1.07	3499
			Native language												
		D1a	Speaking	2.9	15.2	55.0	14.1	8.8	3.9	--	100.0	2516	3.11	.88	2418
		b	Understand speech	2.4	12.8	56.0	15.2	9.7	3.9	--	100.0	2517	3.18	.87	2419
		c	Reading	9.9	22.9	40.2	14.0	7.4	5.6	--	100.0	2515	2.85	1.05	2373

*Dash indicates option is not available.

TABLE 8.11. Intercorrelations among Student Evaluation Form Proficiency Scales

Based on LM-LEP students*

Cohort	Grade	End-of-year ratings by teachers, on Student Evaluation Form	End-of-year ratings by teachers										
			English Skills					Math Skills			Mean Ratings		
			Pronunciation	Oral Communication	Vocabulary	Mech. of Reading	Reading Comprehension	Concept of Nos.	Computation (accuracy)	Word Problems	English	Math	Native Language
A	1	**English skills**											
		Pronunciation		.886	.855	.741	.746	.506	.501	.571			
		Oral communication			.880	.754	.766	.516	.507	.590			
		Vocabulary				.804	.810	.523	.522	.613			
		Mechanics of reading					.916	.578	.583	.643			
		Reading comprehension						.562	.566	.634			
		Math skills											
		Concept of nos.							.942	.799			
		Computation (accuracy)								.829			
		Word problems											
		Mean ratings											
		English										.629	.357
		Math											.516
		Native language											
B	3	**English skills**											
		Pronunciation		.885	.857	.758	.739	.436	.422	.515			
		Oral communication			.884	.784	.776	.483	.468	.553			
		Vocabulary				.803	.816	.513	.495	.582			
		Mechanics of reading					.895	.550	.547	.628			
		Reading comprehension						.577	.567	.668			
		Math skills											
		Concept of nos.							.912	.816			
		Computation (accuracy)								.827			
		Word problems											
		Mean ratings											
		English										.623	.358
		Math											.506
		Native language											

*Columns 1-8 extracted from Tables E-4a and E-4b; Columns 9-11 extracted from Table 9-4a and 9-4b.

TABLE 8.12. Correlation of selected Student Evaluation Form ratings with SAT scores

Based on LM-LEP students*

				End-of-year ratings by teachers							
				English Skills					Math Skills		
Cohort	Grade	SAT Battery, Form, and When Admin.	SAT Score	Pronunciation	Oral Communication	Vocabulary	Mech. of Reading	Reading Comprehension	Concept of Nos.	Computation (accuracy)	Word Problems
A	1	Primary	English								
		1	Vocabulary	.323	.326	.368	.399	.414	.242	.237	.271
		Form F	Rdg.Comprehension	.360	.356	.435	.550	.541	.349	.349	.385
		Spring	English Total	.393	.392	.464	.557	.558	.348	.346	.386
		'85	Math								
			Concepts of No.	.300	.301	.369	.432	.427	.436	.443	.428
			Computation	.163	.190	.224	.300	.299	.424	.440	.404
			Applications	.281	.281	.329	.382	.387	.382	.387	.392
			Comput.+Applic.	.246	.263	.308	.382	.384	.457	.469	.450
			Math Total	.286	.296	.355	.429	.428	.477	.488	.469
			English + Math								
			Total	.374	.379	.451	.543	.543	.458	.463	.474
B	3	Primary	English								
		2	Vocabulary	.386	.386	.398	.381	.397	.205	.217	.272
		Form E	Rdg.Comp.	.411	.440	.461	.543	.547	.320	.318	.381
		Fall	English Total	.465	.485	.506	.558	.568	.320	.324	.393
		'84	Math								
			Concepts of No.	.297	.310	.312	.380	.401	.392	.409	.383
			Computation	.176	.198	.226	.312	.321	.418	.441	.390
			Applications	.332	.344	.349	.394	.400	.360	.378	.387
			Comput.+Applic.	.287	.307	.327	.404	.412	.450	.474	.447
			Math Total	.310	.329	.343	.422	.435	.458	.482	.453
			English + Math								
			Total	.422	.444	.463	.540	.553	.453	.470	.484
B	3	Primary	English								
		3	Vocabulary	.343	.367	.368	.361	.380	.213	.210	.239
		Form F	Rdg.Comp.	.434	.452	.480	.555	.570	.364	.368	.432
		Spring	English Total	.454	.476	.498	.551	.569	.352	.354	.412
		'85	Math								
			Concepts of No.	.285	.299	.310	.405	.400	.430	.452	.426
			Computation	.193	.214	.250	.330	.326	.469	.478	.423
			Applications	.337	.360	.389	.468	.480	.471	.461	.474
			Comput.+Applic.	.290	.316	.352	.441	.445	.526	.526	.500
			Math Total	.308	.331	.362	.459	.460	.530	.537	.509
			English + Math								
			Total	.412	.437	.467	.555	.564	.508	.514	.523

*Correlations in this table have been extracted from Tables E.4a and E.4b.

The average English rating, and the average math rating from the Student Evaluation Form will probably prove more useful than the separately named ratings within math and English. Table 8.13, which summarizes the correlations of these average ratings with SAT English Total and SAT Math, provides evidence to this effect. The correlations between corresponding pairs, i.e. math rating and SAT Math Total are marked with an asterisk; they were gratifyingly high, ranging from .480 to .573.

8B.2.b Correlations Between Student Evaluation Form Ratings and SOPR Ratings

Table 8.14 shows the correlations between English SOPR scales and some Student Evaluation Form rating scales selected because they were supposed to apply to the same oral communication skills as the SOPR scales. No tendency whatever is discernible for the correlations between like-named SOPR and Student Evaluation Form scales to be higher than the correlations between nonmatching scales from the two instruments.

Table 8.15 provides some complementary data, showing correlations of selected native language SOPR scales and English SOPR scales with Student Evaluation Form ratings on native language skills. The Student Evaluation Form ratings on understanding and speaking the native language were substantially correlated with the native language SOPR ratings--as of course they should have been. And not surprisingly, their corresponding correlations with the English SOPR were not only low but negative; correlations with the Raven were also low. Strong evidence is lacking that Student Evaluation Form ratings on speaking the native language and understanding it are worth treating separately, rather than being incorporated in a native language skills average. Apparently the two abilities are so highly correlated that the raters did not find much separation feasible when using the Student Evaluation Form.

TABLE 8.13. Correlations of SAT subtotal scores (English and math) with average English and average math ratings on Student Evaluation Form

Based on LM-LEP students

Cohort	Grade	SAT Battery	SAT Form	SAT Score	Correlation with Student Eval. Form mean rating on: English	Math	No. of Cases
A	1	Primary 1	F	English total	.529*	.370	2030
		(spring '85)		Math total	.392	.491*	
B	3	Primary 2	E	English total	.573*	.356	1406
		(fall '84)		Math total	.420	.480*	
B	3	Primary 3	F	English total	.566*	.385	1406
		(spring '85)		Math total	.437	.542*	

*An asterisk is used to mark the correlations between corresponding variables.

TABLE 8.14. Correlations of Student Evaluation ratings on selected English language skills with English SOPR scores

Based on LM-LEP students

Cohort	Grade	N	English SOPR Scale		Correlation with Student Evaluation Form rating on: Pronunciation	Oral communic.	Vocab.
A	1	1550	A.	Comprehension	.343	.381	.376
			B-E.	Speaking (composite)	.412	.437	.423
			B.	Fluency	.398	.431	.412
			C.	Vocabulary	.391	.422	.410*
			D.	Pronunciation	.387*	.392	.379
			E.	Grammar	.397	.423	.414
			A-E.	Total	.405	.433	.421
B	3	1434	A.	Comprehension	.389	.396	.392
			B-E.	Speaking (composite)	.461	.456	.442
			B.	Fluency	.447	.444	.427
			C.	Vocabulary	.435	.442	.429*
			D.	Pronunciation	.422*	.401	.380
			E.	Grammar	.430	.426	.426
			A-E.	Total	.459	.456	.444

NOTE: Correlations in this table have been extracted from Tables E.4a and E.4b.

*An asterisk is used to mark the correlations between corresponding SOPR and Student Evaluation Form ratings.

TABLE 8.15. Correlations of Student Evaluation Form (SEF) ratings on selected native language skills with SOPR scores and with Raven total

Based on LM-LEP students

	SEF, Native language skills			
	Cohort A, Grade 1		Cohort B, Grade 3	
	Speaking	Understanding	Speaking	Understanding
	CORRELATION COEFFICIENTS			
1. Native language SOPR				
a. Comprehension (Scale A)	.404	.385*	.230	.264*
b. Speech (Scales B-E)	.434*	.385	.287*	.297
c. Total (Scales A-E)	.436	.392	.282	.297
2. English SOPR				
a. Comprehension (Scale A)	-.140	-.160	-.073	-.058
b. Speech (Scales B-E)	-.104	-.122	-.079	-.072
c. Total (Scales A-E)	-.113	-.132	-.080	-.071
3. Raven total	.148	.123	.098	.068
4. Student Evaluation Form (SEF) end-of-year ratings on native language skills				
a. Speaking	--	.899	--	.910
b. Understanding	.899	--	.910	--
MEAN	3.11	3.24	3.08	3.14
S.D.	.99	.94	.86	.85
No. of cases	1393		912	

*An asterisk is used to mark the correlations between corresponding SOPR and Student Evaluation Form ratings.

C. SUMMARY

This chapter is concerned with preliminary data on the Stanford Achievement Test, and on the academic proficiency ratings provided by homeroom teachers who completed Student Evaluation Forms. Basic distributional data on the Stanford are shown in Appendix E. In the chapter itself, means, standard deviations, and a substantial amount of correlational data are presented.

The Student Evaluation Form contains 13 academic proficiency rating scales--7 for English, 3 for math, and 3 for the student's native language. Most of the mean ratings assigned by the students' teachers are low, with the principal exceptions being in two areas of math (concept of numbers and computation) that require little English. From the correlations among the ratings we deduce that the academic proficiency mean ratings in the three major areas--English, math, and native language--will be useful variables, both as predictors in certain contexts and as outcome measures in other contexts.

The distributional data for the Stanford Achievement Test suggest that it is working well. Evidence that the tests used are appropriate for a LM-LEP sample lie in the fact that there was a wide range of scores on each test, but without undue bunching at either end. The correlational data, particularly the pattern of correlations with the Raven, support this conclusion.

Average scores for the LM-LEP group, with the exception of Computation scores, were well below the averages for the two English-proficient groups (EP/LIS and EP/Comp). Almost certainly a contributory factor to the LM-LEP students' relatively strong performance on the Computation Test is that it is the test that makes the least demands on ability to understand written or spoken English.

Although the two English-proficient groups scored better than the LM-LEP students on most of the tests, all three groups tended to be below the national norms.

Among the variables for which correlations with SAT scores were obtained were three home-and-family variables: (1) parents' use of English in the home, (2) parents' education and (3) socioeconomic status. The correlations can at most be characterized as modest, but it is perhaps noteworthy that all three of the home-and-family variables had a higher correlation with SAT Vocabulary than with any of the other SAT tests. In general the correlations of the SAT scores with other variables were just about what would be expected if the SAT were functioning as we hoped it would--in other words, if it were providing useful measures of the extent to which LM-LEP students were learning to read English and were mastering both the English language and mathematics well enough to be prepared to enter an all-English classroom.

CHAPTER 9

OTHER OUTCOMES

Chapter 9. OTHER OUTCOMES[1]

In the previous chapter, outcome variables relating to students' academic performance were discussed. In the present chapter,consideration is given to other outcome measures, some of which, like the SAT tests in year 1 and year 2, also function in certain contexts as predictor variables.

A. STUDENTS' BEHAVIOR

9A.1 THE RATING SCALE

On the Student Evaluation Form students' main teachers were asked, at the end of the year, to rate individual students on each of nine aspects of classroom behavior and interpersonal relations in school, on a three-point scale. The nine aspects are listed in Table 9.1; the footnote of the table shows the three-point scale. The items in this part of the Student Evaluation Form are intended primarily as outcome measures, although in some contexts and for some analyses they may function instead as predictors. This is the opposite of the part of the Student Evaluation Form that was discussed in the preceding chapter--the ratings of subject-matter skills. Those ratings are intended primarily as predictors, and to a lesser extent as outcome measures.

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[1] Abbreviations and other special terms used in this study are defined in the glossary, in Appendix A.

TABLE 9.1. Nine aspects of student's behavior in school to be rated on 3-point scale*
(on Student Evaluation Form)

(1) Area teacher is requested to rate	(2) Students to be rated	(3) If and only if	(4) Behavior to be rated
A. The manner in which the child interacts with others (in all the classes the rating teacher grades)	All students	--	Aa. Gets along well with students from same ethnic group Ab. Gets along well with other students Ac. Gets along well with teachers and other adults
B. Student's typical behavior when:			
1. Being taught English reading and other English language arts	All students	--	B1a. Participates in class actively B1b. Listens to teacher and concentrates on assigned work
2. Being taught mathematics	All students	--	B2a. Participates in class actively B2b. Listens to teacher and concentrates on assigned work
3. Being instructed using the child's native language	Students whose native language is not English	Teacher is proficient in child's native language	B3a. Participates in class actively B3b. Listens to teacher and concentrates on assigned work

*The 3-point rating scale for each of the nine items shown in column 4 was:

1. Seldom or never
2. Sometimes
3. Almost always

A fourth response, "Don't know," was also available. Cases for which this response was marked are treated as if the item were omitted.

9A.2 RESULTS

9A.2.a Distributions of Ratings

Table 9.2 shows the distribution of ratings on the various classroom behavior and interpersonal relations scales on the Student Evaluation Form, separately for each of the three groups (LM-LEP, EP/LIS, and EP/Comp) within each cohort. Table 9.3 summarizes the corresponding means and standard deviations. On the whole, the students were rated quite favorably. The classroom behavior means for LM-LEP students (on a scale from 1 to 3) are in the 2.5 to 2.6 range and some of the interpersonal relations means are quite close to 3. These ratings may reflect actual classroom behavior or they may be a reflection of the well-known reluctance of raters to use the bottom end of a rating scale.

There was a tendency for the LM-LEP students' classroom behavior to be rated more favorably when they were being taught in their native language than when they were being taught English. This is apparent from Table 9.3, although it was not evident in Table 9.2. In Table 9.2, the data for the relevant items (items B3a and B3b, which represent the student's behavior during instruction using the native language) include a high proportion of cases in the "no answer" category: about 26 percent of the grade 1 students and about 30 percent of the grade 3 students. These large percentages are attributable to the fact that the ratings could only be made by teachers who provided instruction to the students through use of the native language. Consequently the percentages in the "Almost always" category are far lower than they would be if they were based only on students for whom ratings were available. Although there was some tendency for the LM-LEP students to receive lower ratings in classroom behavior than the two EP groups, this tendency was quite slight (even though several of the differences are "statistically significant").

9A.2.b Relation of Classroom Behavior to Other Variables

Table 9.4a (for Cohort A) and Table 9.4b (for Cohort B) show the intercorrelations among the classroom behavior ratings, interpersonal relationship ratings, teacher ratings of the students' subject-matter

TABLE 9.2. Percentage distributions of end-of-year Student Evaluation Form ratings by teachers, on interpersonal relations and classroom behavior

Group	Response	PERCENTAGE DISTRIBUTION OF RATINGS BY TEACHERS																		NO.OF CASES	
		Cohort A, Grade 1									Cohort B, Grade 3										
		Interpersonal relations			Classroom behavior						Interpersonal relations			Classroom behavior							
					English		Math		Using Nat.Lang.					English		Math		Using Nat.Lang.			
	Item* →	Aa	Ab	Ac	B1a	B1b	B2a	B2b	B3a	B3b	Aa	Ab	Ac	B1a	B1b	B2a	B2b	B3a	B3b	Cohort A	Cohort B
LM-LEP	Almost always	82.3	77.9	85.4	51.5	53.6	60.1	62.1	45.5	45.4	81.3	76.2	85.9	58.7	63.3	62.3	66.6	43.8	45.0		
	Sometimes	14.1	14.4	11.0	30.4	29.1	30.6	29.0	20.1	20.3	15.6	17.4	11.6	31.2	28.1	29.9	27.0	19.1	18.2		
	Seldom or never	1.6	1.8	1.4	9.0	8.0	7.5	7.0	5.0	4.8	1.5	1.6	1.2	7.7	5.9	6.9	5.2	3.1	2.9		
	Don't know	.4	4.3	.6	4.7	4.7	.5	.6	3.2	3.2	.4	3.2	.4	.7	.7	.2	.2	4.0	4.1		
	No answer	1.6	1.6	1.5	4.4	4.6	1.3	1.3	26.2	26.3	1.2	1.6	1.0	1.7	1.9	.8	1.0	29.9	29.9		
	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	4632	3562
EP/LIS	Almost always	77.5	75.8	81.4	65.7	60.8	62.4	59.6			77.3	74.3	82.3	69.5	67.5	71.3	70.0				
	Sometimes	17.7	18.8	14.3	27.9	31.1	30.2	31.5			16.5	19.2	12.8	22.0	24.3	21.5	22.7				
	Seldom or never	2.2	2.5	1.3	4.0	5.3	4.1	5.4			2.0	2.6	2.1	3.9	3.6	3.8	3.8				
	Don't know	1.0	1.0	1.1	.1	.0	.0	.0			2.8	2.1	2.1	2.4	2.4	2.6	2.6				
	No answer	1.7	1.9	1.9	2.3	2.9	3.4	3.5			1.5	1.7	.7	2.2	2.2	.8	.8				
	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0	100.0	100.0	100.0	100.0	100.0	100.0			834	717
EP/Comp	Almost always	73.6	71.4	74.8	65.0	59.1	61.6	58.4			78.1	74.5	78.8	63.7	62.7	63.1	62.0				
	Sometimes	19.3	22.0	18.6	27.0	28.6	28.9	29.1			17.4	20.8	17.6	29.4	29.0	30.0	29.8				
	Seldom or never	3.9	3.9	3.0	4.8	9.1	6.4	9.3			3.4	3.2	2.4	4.9	6.0	5.6	6.0				
	Don't know	.2	.0	.0	.2	.2	.5	.5			.4	.2	.0	.0	.0	.0	.0				
	No answer	3.0	2.7	3.6	3.0	3.0	2.7	2.7			.6	1.3	1.3	1.9	2.4	1.3	2.1				
	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0	100.0	100.0	100.0	100.0	100.0	100.0			440	466

*The letter codes for the items are those shown in column 4 of Table 9-1.

TABLE 9.3. Means and standard deviations corresponding to Table 9.2 distributions

			Cohort A, Grade 1			Cohort B, Grade 3		
Areas rated	Item*		LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
Interpersonal relations	Gets along with:							
	Aa. Students from own ethnic group	Mean**	2.823	2.773	2.721	2.810	2.787	2.755
		S.D.**	.423	.469	.531	.430	.457	.505
		N	4541	812	426	3508	686	461
	Ab. Other students	Mean**	2.808	2.754	2.694	2.784	2.745	2.723
		S.D.**	.440	.487	.541	.451	.495	.516
		N	4360	810	428	3392	690	459
	Ac. Adults	Mean**	2.858	2.826	2.745	2.859	2.825	2.774
		S.D.**	.388	.414	.502	.380	.433	.473
		N	4534	809	424	3512	697	460
Classroom behavior when being taught: 1. English	B1a. Participates actively	Mean**	2.467	2.633	2.622	2.523	2.687	2.600
		S.D.**	.669	.560	.578	.638	.545	.584
		N	4211	814	426	3476	684	457
	B1b. Listens, concentrates	Mean**	2.502	2.572	2.516	2.590	2.670	2.580
		S.D.**	.654	.595	.662	.603	.546	.606
		N	4201	810	426	3467	684	455
2. Math	B2a. Participates actively	Mean**	2.535	2.603	2.570	2.560	2.699	2.583
		S.D.**	.634	.569	.614	.620	.537	.597
		N	4546	806	426	3528	692	460
	B2b. Listens, concentrates	Mean**	2.561	2.561	2.507	2.621	2.686	2.572
		S.D.**	.624	.599	.666	.584	.542	.607
		N	4545	805	426	3519	692	456
3. In native language	B3a. Participates actively	Mean**	2.574			2.615		
		S.D.**	.621			.576		
		N	3270			2354		
	B3b. Listens, concentrates	Mean**	2.577			2.638		
		S.D.**	.616			.564		
		N	3265			2352		

*For exact wording of items, see Table 9-1, column 4.

**The 3-point rating scale for each of the nine items, as indicated in the footnote of Table 9-1, was:

1. Seldom or never
2. Sometimes
3. Almost always

TABLE 9.4a. Correlations among Student Evaluation Form ratings and other variables: Cohort A, Grade 1

Based on LM-LEP students

Sutdent Eval.Form Ratings

		STUDENT EVALUATION FORM Ratings												SAT Spring '85 Primary 1 Form F					Native lang. SOPR	Raven				
		Interpersonal relations			Classroom behavior during: English		Math		Use of Nat.Lang.		Mean skills rtgs.													Possible
		Aa	Ab	Ac	B1a	B1b	B2a	B2b	B3a	B3b	Eng.	Math	Native Lang.	Vocab.	Rdg.	Eng Tot	Math Tot	Tot	Total	CPM	Mean	SD	N*	range
		← CORRELATION COEFFICIENTS →																						
Interpersonal relations																								
	Aa**		.914	.730	.283	.416	.312	.421	.230	.343	.146	.201	.120	.114	.147	.153	.214	.204	.123	.107	2.843	.397	2030	1-3
	Ab**			.738	.288	.419	.322	.421	.225	.336	.154	.190	.100	.130	.157	.167	.221	.215	.126	.118	2.828	.417	2030	1-3
	Ac**				.287	.432	.312	.439	.258	.381	.129	.176	.081	.119	.136	.147	.186	.185	.093	.127	2.877	.367	2030	1-3
Classroom behavior during:																								
Eng.	B1a**					.690	.748	.517	.578	.406	.395	.392	.290	.159	.270	.258	.304	.311	.154	.169	2.534	.635	2030	1-3
	B1B**						.576	.774	.455	.643	.356	.411	.259	.183	.286	.280	.341	.344	.181	.215	2.554	.633	2030	1-3
Math	B2a**							.693	.712	.539	.298	.447	.338	.149	.212	.213	.322	.298	.229	.152	2.597	.607	2030	1-3
	B2B**								.540	.763	.266	.443	.308	.174	.240	.245	.352	.331	.207	.187	2.615	.599	2030	1-3
Native lang. use	B3a**									.716	.176	.336	.460	.118	.121	.136	.283	.235	.360	.190	2.616	.596	1399	1-3
	B3b**										.163	.338	.433	.172	.169	.193	.307	.279	.301	.226	2.602	.599	1399	1-3
Mean skills ratings	Eng											.629	.357	.368	.526	.529	.392	.506	-.009	.266	2.432	.948	2030	1-5
	Math												.516	.259	.366	.370	.491	.477	.174	.319	2.974	.919	2030	1-5
	Native lang.													.102	.119	.127	.210	.188	.437	.157	3.052	.986	1442	1-5
SAT Spring '85 Prim.1 Form F	Vocab.														.512	.807	.513	.724	-.156	.238	18.940	5.596	2030	0-38
	Rdg.															.920	.592	.829	-.015	.341	23.102	8.462	2030	0-40
	Eng. Tot.																.640	.899	-.082	.342	42.042	12.306	2030	0-78
	Math Tot.																	.912	.127	.457	49.797	13.138	2030	0-79
	Total (Eng. + Math)																		.030	.443	91.839	23.045	2030	0-157
Native lang.	SOPR Total																			.085	19.899	5.686	1545	5-25
Raven	CPM																				18.626	5.788	2030	0-36

*The 15 variables for which N=2030 constitute a "listwise" set. For the remaining four variables, all cases were within the listwise set, but the variables were handled on a pairwise basis.

**Coded as in column 4 of Table 9-1.

TABLE 9.4b. Correlations among Student Evaluation Form ratings and other variables: Cohort B, Grade 3
Based on LM-LEP students

Student Eval. Form Ratings

		STUDENT EVALUATION FORM Ratings												SAT - Fall '84 Primary 2 - Form E					SAT - Spring '85 Primary 3 - Form F										
		Interpersonal relations			Classroom behavior during:						Mean skills rtgs.																		
					English		Math		Use of Nat.Lang.																				
		Aa	Ab	Ac	B1a	B1b	B2a	B2b	B3a	B3b	Eng.	Math	Native Lang.	Vocab.	Rdg.	Eng Tot	Math Tot.	Tot	Vocab.	Rdg.	Eng Tot	Math Tot.	Tot	Native language SOPR Total	Raven SPM	Mean	SD	N*	Possible range
		← CORRELATION COEFFICIENTS →																											
Interpersonal relations	Aa**		.840	.729	.351	.489	.350	.447	.359	.443	.187	.242	.170	.040	.177	.144	.162	.174	.109	.204	.192	.224	.235	.211	.095	2.840	.393	1406	1-3
	Ab**			.676	.361	.454	.358	.444	.344	.429	.195	.221	.144	.009	.166	.123	.109	.129	.070	.191	.168	.174	.191	.186	.060	2.804	.424	1406	1-3
	Ac**				.361	.460	.337	.446	.324	.419	.177	.232	.175	.054	.153	.133	.160	.167	.110	.194	.185	.195	.213	.193	.084	2.885	.343	1406	1-3
Classroom behavior during: Eng:	B1a**					.636	.761	.551	.649	.515	.354	.408	.266	.123	.266	.244	.313	.320	.172	.315	.298	.346	.364	.193	.182	2.604	.567	1406	1-3
	B1b**						.570	.784	.472	.673	.298	.390	.217	.089	.228	.202	.287	.283	.154	.309	.287	.340	.354	.224	.139	2.649	.556	1406	1-3
Math	B2a**							.635	.653	.522	.280	.425	.251	.076	.198	.175	.307	.284	.118	.255	.233	.349	.335	.187	.149	2.627	.564	1406	1-3
	B2b**								.518	.726	.276	.430	.228	.062	.198	.169	.304	.279	.119	.284	.255	.356	.350	.198	.153	2.669	.537	1406	1-3
Native lang. use	B3a**									.694	.212	.369	.332	.012	.194	.146	.284	.257	.075	.251	.212	.319	.309	.328	.135	2.645	.539	908	1-3
	B3b**										.201	.350	.272	.021	.203	.156	.286	.262	.052	.267	.214	.327	.315	.287	.141	2.683	.515	908	1-3
Mean skills ratings	Eng											.623	.358	.430	.540	.573	.420	.544	.398	.561	.566	.437	.548	-.083	.234	2.488	.866	1406	1-5
	Math												.506	.245	.350	.356	.480	.483	.231	.402	.385	.542	.531	.088	.325	2.927	.932	1406	1-5
	Native Lang.													.013	.133	.102	.187	.172	-.006	.115	.081	.268	.214	.297	.113	2.960	.843	935	1-5
SAT Fall'84 Prim.1 Form F	Vocab.														.484	.779	.400	.626	.577	.497	.589	.314	.479	-.222	.209	15.641	4.953	1406	0-35
	Rdg.															.926	.550	.794	.450	.730	.711	.544	.684	.008	.361	22.954	8.239	1406	0-40
	Eng. Tot.																.567	.840	.572	.738	.764	.525	.697	-.090	.349	38.595	11.487	1406	0-75
	Math Tot.																	.924	.370	.536	.538	.754	.740	.064	.479	70.489	16.277	1406	0-108
	Total (Eng. + Math)																		.510	.697	.710	.742	.813	.000	.478	109.084	24.677	1406	0-183
SAT Spr.'83 Prim.3 Form F	Vocab.																			.544	.787	.372	.609	-.145	.187	14.378	5.523	1406	0-38
	Rdg.																				.946	.617	.841	-.023	.346	28.481	10.476	1406	0-60
	Eng. Tot.																					.597	.854	-.073	.326	42.859	14.253	1406	0-98
	Math Tot.																						.927	.123	.493	66.984	19.785	1406	0-114
	Total (Eng. + Math)																							.046	.472	109.843	30.519	1406	0-212
Native Lang. SOPR	Total																								.093	20.805	5.173	1180	5-25
Raven	SPM																									26.398	9.277	1408	0-60

*The 20 variables for which N=1406 constitute a "listwise" set. For the remaining four variables, all cases were within the listwise set, but the variables were handled on a pairwise basis.

**Coded as in column 4 of Table 9-1.

skills, selected SAT scores, total score on the native language SOPR, and the Raven score.

There were substantial intercorrelations among ratings of the various classroom behaviors. The intercorrelations among the three "Participates in class actively" variables and among the three "Listens to teacher and concentrates on assigned work" variables tended to be a little higher, particularly in grade 1, than the correlations between the two variables within a subject-matter area[1]. In other words teachers apparently perceived students' typical mode of behavior as more a function of students' modus operandi than of the nature of the material being taught.

However, a somewhat different picture emerges when the correlations of the six classroom behavior variables with the teachers' ratings of the students' subject-matter skills and with the SAT scores are considered. The mean skills rating for English had higher correlations with the two classroom behaviors for English classes than with either of the other two pairs of classroom behaviors. Likewise, the mean rating for math skills had higher correlations with behavior in math classes than with behavior in English classes or in classes using the student's native language. A similar relationship applies to the mean rating in native language skills; and it still applies when the rating that is correlated with classroom behaviors is the total score from the native language SOPR (in the fall) rather than the mean from the Student Evaluation Form (in the spring). Thus there seems to be a definite tendency for a teacher's perception of the student's skills in an area to correlate with perception of the student's behavior when being instructed in that area.

The same relationship holds at least partially when we replace subjective ratings of skills with objective measures of those same skills.

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[1] The differences, though quite small, are mostly statistically significant at the .05 level. Some readers may wonder why these small differences are worth talking about, when certain small differences in means, mentioned in the previous section, were discussed as probably being of no real significance. The reason is that the means being compared were based on ratings of different students, by different teachers, whereas the differences in correlations mentioned here involve ratings of the same students, by the same teachers.

Using SAT English language arts and mathematics scores instead of ratings by teachers of performance in those areas, we find that for English the relationship still holds. The SAT English total score (Vocabulary plus Reading) had a higher correlation with classroom behavior in English classes than in math classes or classes taught in the child's native language. This was true not only for Cohort A (grade 1) but for both the fall and spring SAT testing of Cohort B (grade 3). For SAT math, however, no clear-cut relation of this sort emerged, in either cohort.

The interpretation of the pattern of relationships described above is by no means clear. More attentive behavior in class may result in better learning; or conversely students may be more attentive and participate more enthusiastically in subjects in which they are interested and doing well. Or possibly the teachers' evaluations of students' classroom behavior either color their evaluations of achievement levels attained or, if one views the situation from the opposite direction, are colored more by their subjective evaluations of achievement than by the achievement level actually attained, as measured objectively. These varied possibilities serve as a reminder that concomitance is not causation.

9A.2.c Relation of Interpersonal Relations Variables to Other Variables

The three top rows of Tables 9.4a and 9.4b contain the correlations of the three interpersonal relations variables with each other and with the other variables in the matrices. The highest correlation involving these three variables was the one between variables Aa ("Gets along well with students from same ethnic group") and Ab ("Gets along well with other students"). This correlation (r = .914 in grade 1) carries the happy message that at least insofar as the teachers perceive the situation, the first-grade children were not practicing ethnic discrimination.[1]

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[1] The correlation drops substantially in grade 3 down to .840. However although the difference between the grade 1 and grade 3 correlations is unquestionably statistically significant (at the .00000005 level of significance), it seems, in view of the fact that the means and standard deviations were about the same for the two grades, and that the means were very close to the maximum possible, that the drop in correlation is more likely due to some statistical aberration, such as an idiosyncratic drop in reliability of one or both items, than to any increase in ethnic bias.

Table 9.5a, which presents the cross-tabulation between variables Aa and Ab, separately for clusters A and B combined, cluster C, and clusters D, E, and F combined, highlights this situation. Bias, if any, against members of ethnic groups other than one's own would be inferable if there were a large number of cases below the main diagonal. But there were very few such cases in any cluster group, in either grade 1 or grade 3. It is also encouraging to note as well that there is no basis for inferring bias on the part of either of the English-proficient groups.

Table 9.5b shows the percentage of children in each group who were rated in the "Almost always" category on both variables Aa and Ab--in other words children who were perceived to get along well not only with children from their own ethnic group but also with other children. Most of these percentages are in the vicinity of 80 percent.

The correlations of the three interpersonal relations variables with the Raven and with achievement tests and ratings in academic skills areas were generally low, as they should be. Moreover, even the correlations with the classroom behavior ratings were only modest. Thus, it appears that in filling out the Student Evaluation Forms most of the teachers made a concerted effort to really think about the variable being rated, thus holding in check the tendency towards "halo" in ratings. This should augment the utility of the Student Evaluation Form in its dual role of providing predictor variables and outcome variables.

9B

B. EXIT FROM LM-LEP SERVICES AND FROM LM-LEP STATUS

"Exiting" from LM-LEP services is not a well-defined concept; nor is its companion concept, exiting from LM-LEP status. Each state, or in some states each school district, has its own standards and its own rules. In some jurisdictions students who have "exited" from LM-LEP status, i.e., students formerly LM-LEP who have now been declared to be "English-proficient" (EP), continue to receive services of some sort because it is thought that they still need them; in other jurisdictions students who are not receiving services are "English-proficient" by definition, irrespective

TABLE 9.3a. Cross-tabulations of Student Evaluation Form items Aa and Ab,* by grade, group, and cluster

Group	Spring '85 Clusters	ITEM Aa. GETS ALONG WITH STUDENT FROM SAME ETHNIC GROUP ↓	NO. OF CASES									
			Cohort A - Grade 1					Cohort B - Grade 3				
			Seldom or never	Some-times	Almost always	Total	(Don't know or no ans)**	Seldom or never	Some-times	Almost always	Total	(Don't know or no ans)**
			Item Ab. GETS ALONG WITH OTHER STUDENTS									
LM-LEP	A-B	Seldom or never	17	2		19		10			10	
		Sometimes	4	119	12	135		8	82	8	98	
		Almost always	1	35	861	897			30	461	491	
		Total	22	156	873	1051	(104)	18	112	469	599	(32)
		(DK or no ans)**				(12)	(104)				(3)	(32)
LM-LEP	C	Seldom or never	11			11		16	1		17	
		Sometimes	2	134	7	143		1	136	7	144	
		Almost always		11	779	790			39	733	772	
		Total	13	145	786	944	(34)	17	176	740	933	(67)
		(DK or no ans)**				(5)	(35)				(6)	(68)
LM-LEP	D-F	Seldom or never	26			26		8	6	1	15	
		Sometimes	1	202	10	213		4	204	9	217	
		Almost always		18	1040	1058			42	1180	1222	
		Total	27	220	1050	1297	(28)	12	252	1190	1454	(54)
		(DK or no ans)**				(45)	(46)				(27)	(62)
EP/LIS		Seldom or never	18			18		13			13	
		Sometimes	3	140	3	146		5	110	2	117	
		Almost always		16	622	638			27	527	554	
		Total	21	156	625	802	(24)	18	137	529	684	(27)
		(DK or no ans)**				(22)	(32)				(31)	(33)
EP/Comp		Seldom or never	14	2	1	17		12	4		16	
		Sometimes	3	82		85		2	76	2	80	
		Almost always		12	312	324		1	16	344	361	
		Total	17	96	313	426	(12)	15	96	346	457	(7)
		(DK or no ans)**				(14)	(14)				(5)	(9)

*See Table 9-1.

**Numbers in parentheses in row or column marked by asterisk represent cases omitted from cross-tabulation, because rater marked "Don't know" option or omitted item. The count at the intersection of the double-asterisked row and column is the total number of cases lacking valid answers.

TABLE 9.5b. Children rated in the "almost always" category on both items Aa and Ab of the Student Evaluation Form

Item Aa. Gets along with students from same ethnic group
Item Ab. Gets along with other students

		Cohort A - Grade 1			Cohort B - Grade 3		
		Cases in "almost always" category on both items			Cases in "almost always" category on both items		
Group	Spring '85 Clusters	No.	%	Total no. of cases	No.	%	Total no. of cases
LM-LEP	A-B	861	81.9	1051	461	77.0	599
LM-LEP	C	779	82.5	944	733	78.6	933
LM-LEP	D-F	1040	80.2	1297	1180	81.2	1454
EP/LIS		622	77.6	802	527	77.0	684
EP/Comp		312	73.2	426	344	75.3	457
Total		3614	80.0	4520	3245	78.6	4127

of their degree of proficiency in English. Because of the wide variety of definitions of LM-LEP (e.g., anyone who is not considered English-proficient) and the impracticality of imposing a uniform definition, we have had to use the local definition of LM-LEP to define our population.

However, in collecting data each year we have gone considerably beyond local definitions in an effort to clarify what is really happening. We collect data during each data collection period not only on whether the student is still officially LM-LEP, but also on a wealth of supplementary information, including:

1. Whether the student is still receiving LM-LEP instructional services.
2. What procedures are followed in the school for deciding about such matters as LM-LEP status, change of such status during the school year or at the end of the year, transfer from one program to another, etc. For this purpose an unstandardized "Programs and Procedures" interview is conducted at each school in an effort to get detailed information on how students are evaluated for LM-LEP services, what program options are available, length of services, curricula employed, procedures for review of LM-LEP status, and procedures for school year and end-of-year assignments.

In one sense exiting from the program, rather than being an outcome measure, might be regarded as part of the treatment. When the child is exited he may find himself transferred from a somewhat sheltered environment, in which instruction is offered in his native language, to a traditional all-English classroom, in which he receives no special services. Thus the outcome question becomes not just "Has the student been exited?" but instead "Having been exited, is the student now carrying on successfully in an all-English classroom?" That question represents the real criterion.

As indicated above, we are collecting data on the various aspects of the exit-and-post-exit situation. We shall have criterion data on the LM-LEP students after they have exited, because we will continue to administer the Stanford Achievement Test to them, and to collect evaluation ratings from the teachers.

Although we have collected data of the sort alluded to above during the winter and spring data collection periods of the first year, our Year 1 data on these matters will not be complete until we have found out in our Year 2 data collection who was exited at the end of Year 1, and until we have gotten some information on what happened to those exited students afterwards. Therefore we are not including any empirical data on exiting and post-exiting in the present report. But we plan to report fully on these matters in the Year 2 report, which will cover the study's first two years considered as a whole, and in the final report after all three years of the Longitudinal Study have been completed.

9C C. SUMMARY

In this chapter two sets of "outcome variables" other than academic performance are discussed. The first set consists of the Student Evaluation Form ratings by teachers on the student's classroom behavior and interpersonal relationships. The second is the set of rather loosely related constructs, (1) exit from LM-LEP instructional services, (2) officially becoming an "English-proficient" (EP) student, and (3) success in an all-English classroom.

The Student Evaluation Form rating scales, like the Stanford Achievement Tests, can best be regarded as functioning both as predictor variables and as outcome measures. Which role is played in a given analysis depends on whether the ratings are given in the first, second, or third year of the study, and on what the purpose of the specific analysis is. The empirical data presented suggest that on the whole the non-academic scales of the Student Evaluation Form give promise of being useful outcome measures for an area of outcomes not otherwise measured by any instrument in the study.

"Exiting" from services, it is pointed out, is not a clearly defined concept with the same meaning everywhere--or even necessarily with its own clear, unambiguous meaning at any particular site. Furthermore being defined as "English-proficient" and no longer "LM-LEP" is no clearer, at many sites, than the "exit" concept. The two concepts, moreover, seem only loosely related. Therefore, it is our intention to continue our efforts to explore these fuzzy concepts in depth, in order that those of our analyses that involve these concepts will be useful and will have a clear, unambiguous meaning.

We propose that the concept of "exiting" should have only a very limited role as a criterion variable. Its main role should be as an indicator of "treatment"--more specifically as a prelude to transfer to an all-English classroom. Success in an all-English classroom, in which no special LM-LEP services are provided, then becomes the ultimate criterion, at least for those students who are put in such classrooms before the end of Year 3 of the study.

CHAPTER 10

SUMMARY AND IMPLICATIONS

Chapter 10. SUMMARY AND IMPLICATIONS[1]

10A A. BACKGROUND AND INTRODUCTION

The number and diversity of special services provided to language-minority limited-English-proficient (LM-LEP) students have increased tremendously in the past twenty years. A constant flow of non-English-speaking immigrants, passage of the Bilingual Education Act in 1968, and legislative actions in many states and localities have stimulated school districts to increase the number of instructional services specifically designed to meet the educational needs of LM-LEP children. As federal, state, and local government involvement in this area has grown, so too has the need for accurate information on the different kinds of services being provided to LM-LEP students and on how they affect these students' performance in all-English-medium classrooms. To address this need for accurate and pedagogically useful information, in 1982 the U.S. Department of Education funded the "National Longitudinal Evaluation of the Effectiveness of Services for Language-Minority Limited-English-Proficient Students." The study consists of two phases: the Descriptive Study and the Longitudinal Study.

The results of the descriptive phase of the study were published in spring 1985 (Young et al.). Its findings were based on a national probability sample of 19 states, and within them 191 public school districts.

This report presents the results of the data collection during the first year of the three-year longitudinal phase. As in any longitudinal study, the full meaning from the data must await analyses which encompass data collected at different times. Thus, the present report necessarily must be regarded as preliminary and partial. For the richness that comes with longitudinal data it will be necessary to wait for the final report based on data from all three years of the study.

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[1] Abbreviations and special terms used in this study are defined in the glossary, in Appendix A.

B. PURPOSE AND DESIGN

The goal of the Longitudinal Study is to acquire an understanding of the degree to which educational services provided to language-minority limited-English-proficient (LM-LEP) students in grade levels 1 through 5 are effective in assisting such students to function successfully in all-English-medium classrooms. The major objectives of the study are:

- to determine the degree to which services provided are effective collectively in enabling LM-LEP students in grade levels 1 and 5 to function successfully in all-English-medium classrooms; and
- to determine which instructional services and combinations of services are most effective under specific conditions.

Data collection for the Longitudinal Study began in the fall of 1984. The study's basic plan calls for a three-year study of two cohorts of students, one cohort consisting of students in grade 1 in the fall of 1984 and the other consisting of students in grade 3 at that time. The students are in a national sample of schools selected from the study's descriptive phase. Included in each cohort are all of the LM-LEP students in the 86 schools in the sample, all of the English-proficient students who are receiving special instructional services designed for LM-LEPs (the EP/LIS group), and a sample of English proficient students who have never been designated as LM-LEP nor received special, language-related instructional services (the EP/Comp group). Table 10.1 summarizes the number of students in each of these groups who were active in the study at some time during the study's first year.

TABLE 10.1. Number of students in the study at any time during 1984-85 school year

		Number of Students Ever in the Study			
Cohort	Grade	LM-LEP	EP/LIS	EP/Comp	Total
A	1	5541	997	553	7091
B	3	4222	895	553	5670
Total		9763	1892	1106	12,761

The study began and ended its first year with the participation of 86 schools located in 18 school districts. The districts are largely in major cities, but included are some less urbanized areas in the Southwest. From the start, school and district personnel have been quite interested in the study and have greatly facilitated its implementation.

The design of the study was developed out of two main conceptual considerations. The first involved a child-centered approach to the definition of the types of educational services received by LM-LEP students. In this approach, services for instructional programs are categorized into one of various major sets or clusters of services (we will call them "service clusters"). This orientation is based on an assumption that children in the same class or instructional program can have quite different instructional experiences because of differences in their native-language and English-language proficiency. Thus, information on the instructional experience of each student is obtained and analyzed separately, enabling children in the same classroom to be designated as in different service clusters. This approach avoids the confusion which is likely when popular but non-specific terms such as "bilingual program," "transitional bilingual program," "ESL program," or "mainstream program" are used.

The design was also guided by a conceptual model for predicting LM-LEP student outcomes. This model was based on the literatures on academic achievement pertaining to monolingual students, language minority students, and bilingual students. The literature review focused particularly on research pertaining to: effective schools, effective teaching, second language acquisition, and the academic achievement of language minority students. From the literature review a set of major variables was identified, and a conceptual model defining likely relationships among these variables was described. The study's data collection instruments and preliminary analysis plans were then developed from the predictive model.

C. OVERVIEW OF YEAR 1 IMPLEMENTATION

During the first year of the study at least four visits were made to the 18 school districts. The first visit took place in the fall of 1984. Its purpose was to familiarize school principals and staff with the study, to compile rosters of the students in the study, to identify teachers and support staff working with those students at each school, and, where required, to send home parent permission forms. Following the initial visit, three other visits were made to all 86 participating schools to collect data. These visits were in the fall, winter, and spring.

The fall data collection visits took place between early October and late December, and required an average of two weeks per school district. Winter site visits were conducted in late January and early February, with data collection teams spending an average of one week at each site. The spring site visits began in mid-April and were completed by early June; approximately two weeks were spent at each site.

The primary tasks of the fall data collection were to confirm which students were to participate in the study, to collect baseline measures, and to collect initial descriptions of student instructional treatments. More difficulties were encountered than expected in determining which students were to participate in the study. Many schools do not complete the process of designating which students are LM-LEP until well into the school year; frequently preliminary designations are made which are altered on the basis of further testing and classroom performance during the first two or three months of school. As a result, fall data collection was completed on the basis of the best information available through the schools. However, additions and deletions to the study's student sample were made through the end of the winter data collection on the basis of school-based reclassification decisions.

More specifically, the data collected in the fall included: ratings of students' oral proficiency in English and their native language, information about students' parental and home characteristics, and descriptions of the instructional treatments each student received. In addition, measures of academic aptitude (using the Raven Progressive Matrices) and of academic performance (using the Stanford Achievement Test) were obtained from third grade students. During the winter visit, a second description of the instruction being received by each student was obtained, as was the baseline measure of academic aptitude (Raven Progressive Matrices) for first graders. The spring data collection included: a third description of each student's instructional treatment, the administration of the Stanford Achievement Tests to all categories of students in the study, and teacher ratings of each student's academic performance in English and math. Officials in some schools would not permit some of their students to be tested because they believed testing a student who had little proficiency in English would needlessly frustrate and potentially harm the child. Most students, however, completed all of the study's achievement tests, and there were large enough numbers of students tested in all language proficiency and service cluster categories to make the comparisons called for in the study's analytic plan. In addition, data were collected on the salient characteristics and practices of each school in the study and on the background and approach of each of the student's teachers.

In sum, all essential aspects of the first year of field operations were carried out in accordance with the study's plans, and the data from Year 1 needed to implement the analytic plan were successfully obtained. There were, of course, changes in detail, and in retrospect the burden on some schools and teachers and on all the data collection staff, especially during the fall site visit, was substantially greater than anticipated. Nevertheless, and despite some taxing moments, all schools continued with the study throughout the year, and all which continue to have study students enrolled are fully participating in Year 2.

10D

D. HIGHLIGHTS OF YEAR 1 FINDINGS

Data from the first year of field operations have been analyzed to provide descriptions of the students and schools in the study and the services the students receive. These data have some value in their own right as interesting descriptors of students and services received by a large and varied group of LM-LEP students. More importantly from the perspective of the Longitudinal Study, they serve as baseline descriptors of key variables on which the academic achievement analyses in the second and third year of the study will be based. Highlights of the Year 1 findings are presented below.

10D.1 FAMILY AND HOME CHARACTERISTICS

Parents of LM-LEP students in the study were surveyed during the fall of 1984, and survey responses were obtained from the parents of 85 percent of students. The results indicate that there are meaningful language group differences on such factors as parental presence, socioeconomic status, language use in the home, parent-child conversations about school, time spent on homework and reading, and parental expectations concerning the child's eventual educational achievement (see Table 10.2). These differences emphasize the importance of not assuming similarities among LM-LEP students from different language groups, and the potential importance of parent and home variables as predictors of academic outcomes.

The data suggest that the Spanish language students in the Longitudinal Study are more likely than other LM-LEP students to come from homes missing a male guardian and from families of lower socioeconomic status. Spanish language students were also reported to spend less time on homework and other reading, and their parents had lower expectations about their eventual academic achievement. All of these findings would appear to suggest that Spanish language students in the study might have lower academic achievement than other LM-LEP groups.

On most variables, Chinese language students in the study come from homes whose characteristics would be thought to lead to greater academic achievement. However, parents of Chinese language students reported using less English in the home than other LM-LEP groups, and also reported less frequent conversations about school. The pattern of results is thus quite complex, so that in outcome analyses it will be important to consider these variables while examining differences in outcomes related to different instructional services.

TABLE 10.2. Summary of selected family and home characteristics[a]

	Cohort A (Grade 1)				Cohort B (Grade 3)			
	Spanish	Chinese	Other	Total	Spanish	Chinese	Other	Total
1) Percentage of households with female parent or guardian, only	22%	10%	14%	21%	21%	15%	16%	20%
2) Percentage of households using only a non-English language in the home	67%	86%	56%	66%	69%	88%	52%	68%
3) Percentage of households where students and parents discuss school almost every day	86%	57%	74%	84%	82%	42%	70%	79%
4) Mean hours per week spent doing homework	4.5	6.6	5.6	4.7	5.1	7.0	6.4	5.4
5) Mean hours per week spent reading	1.5	3.1	2.8	1.7	1.8	3.4	3.7	2.1
6) Mean socio-economic status[b]	13.9	14.7	17.0	14.3	13.5	14.4	15.9	13.8
7) Percentage of households where parents expect their child to go to college or post-high school vocational school	61%	80%	72%	63%	60%	71%	70%	61%

[a] For the complete data on these variables, including the number of cases on which the data are based, refer to Tables 3.1, 3.3, 3.4, 3.7, 3.8 and 3.9.

[b] The range of this composite was from 3 to 29. It was based on the mean educational level of the parents and the highest status occupation of the parents who worked outside the home.

10D.2 STUDENT CHARACTERISTICS

Data were gathered on three categories of students during the fall, winter, and spring of the 1984-85 school year. The number of students in each of the three categories (LM-LEP, EP/LIS and EP/Comp) at any point during the study's first year were presented in Table 10.1.

Students with 45 different language backgrounds were included in the study, and there were some systematic differences in characteristics among students in the various language groups. For most analyses, students were grouped into three language categories: Spanish, Chinese, and Other. The percentage of the total number of students ever in the study in each of these groups and selected characteristics about them are presented in Table 10.3, on the following page.

The length of time students resided in the U.S. varied across the three language groups. The Spanish language students have been in the U.S. longer than either the Chinese or the other language students, with the Chinese language students being in the U.S. the least time.

As might be expected, the length of time students were in the U.S. was related to oral proficiency ratings of the students in English and their native language. Generally, students who had lived in the U.S. longer were rated higher in English language oral proficiency and slightly lower in oral proficiency in their native language.

Students in the Spanish and Chinese language groups were less likely to be rated as fluent (or as a native speaker) in terms of their oral English skills than the other students. With respect to their native language, most students in each of the groups were rated as at least fluent. There were, however, many fewer Chinese students rated as having low proficiency in their native language than in the Spanish or other language groups.

TABLE 10.3. Summary of selected characteristics of LM-LEP students

	Cohort A (1st Grade)				Cohort B (3rd Grade)			
	Spanish	Chinese	Other	Total	Spanish	Chinese	Other	Total
1) Percent of total LM-LEP students	84.3%	4.0%	11.7%	100%	83.8%	5.4%	10.8%	100%
2) Percent of students in mainland U.S. 3 years or less	18.3%	36.3%	30.5%	20.4%	20.1%	46.5%	33.3%	22.9%
3) Mean number years in mainland U.S.	5.39	4.20	4.67	5.25	6.49	4.24	4.99	6.20
4) Mean oral proficiency in English[a]	14.1	14.7	16.5	14.4	16.6	15.8	18.2	16.7
5) Mean oral proficiency in native language[a]	20.7	22.3	19.3	20.7	21.5	21.9	20.4	21.4
6) Mean total English score on Stanford Achievement Tests (Spring '85)[b]	40.4	47.8	45.6	41.5	40.6	47.5	46.0	41.8
7) Mean total math score on Stanford Achievement Tests (Spring '85)[b]	48.1	57.5	51.6	48.8	61.8	85.6	71.6	64.6

[a] Oral proficiency ratings were carried out by teachers using the SOPR. The possible ratings range from 5-25. Five proficiency levels represented by the total score ranges can be generally described as follows: 5-9, Very limited or no oral proficiency; 10-14, Limited oral proficiency; 15-19, Functional oral proficiency; 20-24, Fluent oral proficiency; 25, Native speaker oral proficiency.

[b] Data for the two cohorts are not directly comparable, since different levels of the test were used.

The age of the students, however, did not vary substantially by language group, and overall the students were at essentially the age one would expect for their grade.

10D.3 ACADEMIC APTITUDE

The Raven Progressive Matrices Test was incorporated into the testing plan in order to provide a control variable which would constitute a measure of the child's academic ability and which, unlike most such measures, would not be operationally dependent on a knowledge of the English language. The analyses of Year 1 data indicate that the Raven is performing as expected, and thus was a good choice as the study's measure of academic aptitude.

Table 10.4 provides the mean Raven scores for each of the three groups of students (LM-LEP, EP/LIS, EP/Comp) for each of the two cohorts. As shown, the differences between the mean of the LM-LEP group and the means of the two English-proficient groups (though statistically significant) were comparatively small in both grades. The grade 3 difference, however, was a bit larger than the grade 1 difference. This is not surprising; the grade 3 cohort (Cohort B) does not include in its LM-LEP group any of the students who learned enough English before reaching grade 3 to have been exited from the program. Since ability to learn a foreign language (English, in this

TABLE 10.4. Summary of Raven scores

	Cohort A (Grade 1)			Cohort B (Grade 3)		
	LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
Mean*	18.25	19.54	19.18	25.29	28.26	27.10
SD	5.80	5.71	5.68	9.16	8.97	8.92
Number	4670	759	444	2994	620	403

*The maximum possible score is 36 for the CPM (Grade 1) and 60 for the SPM (Grade 3).

case) is correlated with academic ability, the systematic absence from Cohort B of part of this relatively rapid-learning segment of the LM-LEP population would tend to depress the mean score.

The Raven's correlations with other variables turned out much as expected (and hoped for). Correlations with SAT scores were moderate; correlations with students' age (in grade 1) and with parents' education were slight; and correlations with time in the United States and parents' use of English in the home were essentially zero. This latter finding (the zero correlations of the Raven with time in the U.S. and with parents' use of English) is crucial in justifying the use of the Raven to provide an effective control on academic aptitude, operationally independent of knowledge of English. Further support is provided by a comparison between the correlations based on LM-LEP students and the corresponding correlations based on English-proficient students. The latter are generally higher, the difference being more pronounced for the English tests than the math tests. All this is entirely compatible with the hypothesis that though the limited English proficiency of the LM-LEP students depresses their SAT scores, particularly on the English tests, it does not affect their Raven scores.

10D.4 SCHOOL CHARACTERISTICS

Data on a series of school level variables which may have an impact on the academic achievement of LM-LEP students were collected and analyzed. The variables which are described fall into seven basic categories: (1) general characteristics of the school; (2) academic climate; (3) school language environment; (4) teacher training relevant to LM-LEP students; (5) principals' involvement in school affairs; (6) attitudes of the non-language-minority community; and (7) policies and practices relating to entry and exit from LM-LEP services.

The results indicate that there is considerable diversity among schools on variables within each of these categories. Although the data are presented at the school level, the relevant data will later be transferred onto individual student records, and will then be available for use as control and predictor variables in outcome analyses.

10D.5 TEACHER CHARACTERISTICS

Data on the number and characteristics of teachers and classroom instructional aides were related to each of their students and analyzed at the student level. As shown in Table 10.5, there were systematic differences among the three student language groups in terms of the number and background of their instructional staff. The Chinese language students, for example, were more often taught by only one teacher, but were more likely than the other students to have their teachers assisted by classroom aides or volunteers. Also, teachers of the Chinese students were less likely to have taken college courses related to instruction of LM-LEP students.

The teachers in the study in general were found to be proficient in the use of English; in all but two districts at least 90 percent of teachers were rated as fluent speakers, close to or at a native speaker level of proficiency in oral English. Overall, about a quarter of the students' main teachers at each grade had backgrounds in English but not in the student's native language; about 70 percent had backgrounds both in English and in the student's native language.

10D.6 INSTRUCTIONAL CHARACTERISTICS

Detailed information was collected about the nature of the instruction each student received. This included the amount of time spent in various academic subjects, the languages used for instruction, classroom organization, and the characteristics of the materials used.

As shown in Tables 10.6 and 10.7, there were important differences in the kind and amount of instruction received by LM-LEP students of different language backgrounds. For example, Spanish language students were less likely to receive instruction in English language arts, and more likely to be receiving native language arts instruction than were other students. They also received more instruction presented in their native language. Consistent with these findings, they were also more likely to be using native language materials.

TABLE 10.5. LM-LEP students' academic teachers: Mean number of instructional staff, use of aides and volunteers by main academic teachers and background characteristics of main academic teachers[a]

	Grade 1				Grade 3			
	Total	Spanish	Chinese	Other	Total	Spanish	Chinese	Other
Mean number of instructional staff	1.4	1.3	1.1	1.8	1.4	1.4	1.3	1.9
Percentage of students whose main academic teachers report:								
a)Use of aides	80%	83%	89%	56%	69%	68%	88%	63%
b)Use of volunteers	15%	14%	28%	14%	12%	11%	40%	11%
c)College coursework related to instruction of LM-LEP students	64%	67%	37%	48%	61%	65%	58%	41%
d)Recent inservice/preservice related to instruction of LM-LEP students	50%	50%	62%	48%	63%	67%	58%	41%
Students' main academic teacher's mean language background[b] in:								
a)English	3.1	3.1	2.9	3.2	3.2	3.2	3.1	3.3
b)Student's native language	1.5	1.6	1.4	0.5	1.4	1.5	1.2	0.7

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[a] For the complete data on these variables, including the number of cases on which the data are based, refer to Tables 6.7, 6.8, 6.13, and 6.17

[b] The rating of background in use of each language is based on the sum of the teachers' responses regarding use of the language. A value of one was assigned to each of the following: a) the language is the individual's native language; b) the language has been used extensively since childhood; c) it was the language of instruction for the individual's elementary or secondary education; d) it was the language of instruction for the individuals college/university studies; (e) the individual studied this language as a foreign language in school. The possible scores ranged from 1-4 since, if (b) or (c) was selected it was not possible to also select (e).

TABLE 10.6. Mean hours of instruction and percentage of English language use for instruction in academic subjects[a]

	Grade 1						Grade 3					
	Spanish		Chinese		Other		Spanish		Chinese		Other	
	hrs/ wk	% Eng	hrs/ wk	% Eng	hrs/ wk	% Eng	hrs/ wk	% Eng	hrs/ wk	% Eng	hrs/ wk	% Eng
Regular English[b]												
Reading	2.1	95%	4.4	88%	5.1	93%	3.7	95%	3.8	90%	5.0	94%
Other	1.9	90	2.8	87	3.4	92	2.9	93	3.7	87	4.0	93
Regular English Total	(4.0)	--	(7.2)	--	(8.5)	--	(6.6)	--	(7.5)	--	(9.0)	--
Special English[b]												
Oral English	2.9	93	2.4	92	1.7	94	1.9	94	1.9	94	1.5	91
Reading and other[c]	1.1	91	1.5	88	0.8	93	1.4	94	1.2	88	1.0	89
Special English Total	(4.0)	--	(3.9)	--	(2.5)	--	(3.3)	--	(3.1)	--	(2.5)	--
Mathematics	4.4	61	4.0	71	4.1	86	4.5	78	3.9	80	4.3	87
Science	1.7	59	1.5	69	1.7	86	1.8	75	1.2	79	1.6	87
Social Studies	1.9	58	1.6	67	1.8	84	2.0	75	1.5	78	1.9	84
Ethnic Heritage	0.4	53	0.5	59	0.5	63	0.4	69	0.4	65	0.6	71
Native Language												
Reading	4.0		0.9		1.2		2.7		1.3		0.7	
Other	2.3		0.4		1.0		1.4		0.7		0.4	
Native Language Total	(6.3)		(1.3)		(2.2)		(4.1)		(2.0)		(1.1)	
Total	(22.7)		(20.0)		(21.3)		(22.7)		(19.6)		(21.0)	

[a] The data are presented as follows: the number to the left of the slash indicates the mean number of hours per week of instruction in the subject. The number to the right of the slash indicates the percentage of English language use for instruction. No data was obtained for percentage of English language use for instruction in native language arts. For the number of cases on which these data are based, refer to Tables 6.4 and 6.5.

[b] "Regular English" refers to the English instruction provided to monolingual English-speaking students and other students proficient in English. "Special English" refers to an instructional program, such as ESL, that utilizes materials and methods especially designed for teaching English to LM-LEP students.

[c] "Other" refers to other language arts, i.e., language arts other than reading for regular English; language arts other than reading and oral English for special English instruction.

TABLE 10.7. Classroom organizations and materials used in classrooms of LM-LEP students

	Grade 1			Grade 3		
	Spanish	Chinese	Other	Spanish	Chinese	Other
Mean percentage use of specific classroom organizations reported by students' main academic teachers:						
Whole class	35.8%	38.3%	33.8%	34.5%	35.0%	39.4%
Small group	34.8	33.0	34.3	33.4	31.5	29.2
Individual instruction	13.4	16.7	13.4	13.1	13.5	14.9
Independent work	16.5	12.0	18.6	19.0	20.0	16.5
Percentage of students whose main academic teachers report use of specific types of materials:						
Use of at least some native language materials	67%	32%	16%	58%	35%	23%
Use of at least some English language materials	74%	88%	98%	89%	93%	98%

In contrast, Chinese language students received, on the average, somewhat less instruction in non-language arts academic subjects than other students. Chinese language students had a higher mean number of hours of instruction in regular English language arts than the Spanish language students, but a lower mean for number of hours for special English language arts instruction.

10D.7 INSTRUCTIONAL SERVICE CLUSTERS

There are number of ways to classify instructional services. This study has adopted a child-centered approach built on what prior research suggests are five key variables:

- Extent of native language use in non-language arts instruction;
- Provision of special instruction in English;
- Use of simplified English for non-language arts instruction[1];
- Use of simplified English for instruction in English language arts; and
- Instruction in native language arts.

For the purposes of this study, a service cluster is defined as a set of services provided to a particular student at a particular point in time. Six major service cluster groups and 32 specific clusters were defined in terms of five key instructional variables. More important than the services received at any single time are the services received over the academic year, or over a series of academic years. Therefore, the major service clusters representing instruction during the first year of the study were linked to produce 20 cluster combinations that represented for each student the instructional services provided both in the early and later parts of the year.

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[1] Simplified English refers to the deliberate simplification of vocabulary and sentence structure so that the English used is more easily comprehended by a LM-LEP child.

Examination of the combinations showed that, for the most part, students who began the year receiving academic instruction using the native language continued through the year receiving this type of instruction, though often the extent of native language use was less by year's end. Also, there was less use of native language in instructing third-grade LM-LEP students than first graders.

Because many of the cluster combinations related to similar educational experiences, they were combined into nine cluster sequences which represented nine educationally distinct school year experiences for LM-LEP students. The distribution of these cluster sequences by student's native language is shown in Table 10.8. The data indicate that overall, LM-LEP students in the Spanish and the Chinese language groups were more likely to be in programs which used the native language in instruction than were students from other language backgrounds.

As also shown in Table 10.8, the data indicate there is a relationship between instructional services and English language competencies. Those students receiving instruction heavily using the native language had as a group the lowest ratings on the oral English proficiency measure, while those LM-LEP students not receiving services were rated as the most proficient.

Students in the nine cluster sequences were also compared in terms of their scores on a measure of cognitive ability, the Raven Progressive Matrices test. Perhaps the most notable finding was that the mean scores of those in cluster sequence 1, "Continued Emphasis on Native Language," were considerably lower among third-grade LM-LEP students, relative to third-grade LM-LEP students in other cluster sequences, than it was among first-grade LM-LEP students relative to first-grade LM-LEP students in other cluster sequences.

TABLE 10.8. Description and selected characteristics of cluster sequences

	Cohort A (Grade 1)					Cohort B (Grade 3)				
	Language Group					Language Group				
Cluster Sequences	Spanish	Chinese	Other	English Oral Prof. Rating[b]	Mean Raven Score[c]	Spanish	Chinese	Other	Mean Oral Prof. Rating[b]	Mean Raven Score[c]
1. Continued emphasis on native language	38%	21%	11%	12.6	17.8	17%	14%	11%	13.7	23.6
2. High or moderate to low native language use	10%	27%	6%	14.4	18.7	9%	13%	1%	15.3	25.6
3. High or moderate to minimal use of native language	3%	--	1%	13.8	18.7	4%	1%	--	16.7	24.6
4. Low use to low or moderate use	11%	12%	9%	14.9	18.3	15%	27%	9%	16.0	25.3
5. Low use to minimal use	6%	8%	6%	16.4	19.1	7%	2%	7%	17.1	26.2
6. Marked increase in native language	3%	--	5%	14.8	19.0	2%	--	--	13.1	21.7
7. No use to low use of native language	7%	6%	10%	16.5	18.0	11%	--	16%	18.1	24.6
8. No use of native language but with special instruction in English	14%	10%	33%	15.2	19.0	18%	21%	26%	17.3	25.4
9. No use of native language and no special instruction in English	9%	15%	19%	19.3	18.4	16%	21%	30%	19.7	27.1

[a] For complete data on these variables, including the number of cases on which the data are based, refer to Tables 7.7, 7.8, 7.9, 7.10, 7.11 and 7.12.

[b] Oral proficiency ratings were done by teachers using the SOPR. The possible ratings range from 5-25. Five proficiency levels represented by the total score ranges can be generally described as follows: 5-9, Very limited or no oral proficiency; 10-14, Limited oral proficiency; 15-19, Functional oral proficiency; 20-24, Fluent oral proficiency; 25, Native speaker oral proficiency.

[c] The maximum possible score is 36 for the CPM (Grade 1) and 60 for the SPM (Grade 3).

10D.8 STUDENT ACADEMIC ACHIEVEMENT

It is premature to report data relating measures of student academic achievement to instructional services. The design of the study was based on performing these types of analyses only at the end of Year 2 and Year 3. Therefore, analyses for the first year have been limited to investigating the distributional nature of the achievement measures and their relationships to selected characteristics of the students participating in the study. Two basic measures of academic achievement were selected for the study: the Stanford Achievement Test, and academic proficiency ratings provided by homeroom teachers.

At the end of the school year, teachers completed 13 academic proficiency rating scales--7 for English, 3 for math, and 3 for the student's native language--for each student. Most of the mean ratings assigned by the students' teachers were low, with the principal exceptions being in two areas of math (concept of numbers and computation) that require little English. From the correlations among the ratings we deduce that the academic proficiency mean ratings in the three major areas--English, math, and native language--will be useful variables, both as predictors in certain contexts and as outcome measures in other contexts.

The distributional data for the Stanford Achievement Test suggest that it is working well. Evidence that the tests used are appropriate for a LM-LEP sample lie in the fact that there was a wide range of scores on each test, but without undue bunching at either end. The correlational data, particularly the pattern of correlations with the Raven, support the conclusion that the Stanford Achievement Test was an appropriate choice for the study.

Average scores for the LM-LEP group, with the exception of Computation scores, were well below the averages for the two English-proficient groups (EP/LIS and EP/Comp). Almost certainly a contributory factor to the LM-LEP students' relatively strong performance on the Computation Test is that it is the test that makes the least demands on ability to understand written or spoken English.

Although the two English-proficient groups scored better than the LM-LEPs on most of the tests, all three groups tended to be below the national norms.

Among the variables for which correlations with SAT scores were obtained were three home-and-family variables: (1) parent's use of English in the home, (2) parent's education, and (3) socioeconomic status. The correlations can at most be characterized as modest, but it is perhaps noteworthy that all three of the home-and-family variables had a higher correlation with SAT Vocabulary than with any of the other SAT tests. In general the correlations of the SAT scores with other variables were just about what would expected if the SAT were functioning as we hoped it would--in other words, if it were providing useful measures of the extent to which LM-LEP students were learning to read English and were mastering both the English language and mathematics well enough to be prepared to enter an all-English classroom.

10E E. IMPLICATIONS AND CONCLUSIONS

10E.1 IMPLICATIONS FOR THE ANALYTIC PLAN

In Chapter 2 it was indicated that the principal control variables we plan to use in evaluating the effectiveness of instructional services for LM-LEP students will be the fall 1984 scores on the Stanford Achievement Test (available for Cohort B only), the Raven, the english SOPR, and certain home-and-family background information variables (e.g. socioeconomic status, extent of parent's use of English in the home, parents' education, etc.). The intercorrelations among these variables are shown in Table 10.9a (for Cohort A) and 10.9b (for Cohort B).[1] These tables also include the spring

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[1] The correlations in these two tables have been extracted from Tables E.4a and E.4b.

1985 Stanford Achievement Test data, to permit comparison of the various control variables with an early outcome measure.

The patterns of intercorrelations suggest that the Raven and the English SOPR will complement each other nicely in providing controls on aspects of initial abilities that will affect subsequent achievement. The nature of the content of the Raven, a test of reasoning ability, suggests that it will provide a useful measure of general intellectual ability, or what is often referred to as academic aptitude, independent of what language or languages the child knows. The nature of the SOPR, on the other hand, suggests that it will provide an indication of exactly that ability that the Raven has been so carefully designed to exclude--namely knowledge of English. Thus these two instruments, the Raven and the English SOPR, considered jointly should provide excellent controls on the factors that need to be controlled, even when, as in the case of Cohort A, there is no SAT baseline to supplement them.

In the preceding paragraph we have outlined what logic would suggest about the roles of the Raven and the English SOPR as potential control variables. And when we look at the relevant correlations in Tables 10.9a and 10.9b we find that the empirical data support these expectations. The Raven had substantial correlations with the spring 1985 SAT scores; likewise the correlations of the SOPR with the SAT Vocabulary and Reading Comprehension tests and also with those math tests that involve a substantial requirement for comprehension of English (either spoken or written) were sizable; but the correlations between the Raven and SOPR were very low. This is the ideal situation for a set of control variables (or predictor variables). They combine most effectively when the intercorrelations among them are low in comparison with their correlations with the criterion variable (e.g., SAT).

The empirical data also suggest, though they do not prove, that the English SOPR may be preempting, or absorbing, much of the relevant variance that the home-and-family background variables could be expected to provide. Note, for instance, that in both cohorts SES is correlated with SOPR to at least the same extent as the highest correlation between SES and a Stanford

TABLE 10.9a. Intercorrelations among some prospective control variables: Cohort A, Grade 1*
Based on LM-LEP students

	Stanford Achv.Test - Primary 1 - Spr.'85								English SOPR			Characteristics of home and parents		
	ENGLISH			MATH				Total						
	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Total	English + Math	Total	Comprehension	Speaking	Parents' Use of English	Parents' Education	SES
	CORRELATION COEFFICIENTS													
Raven CPM	.242	.351	.350	.438	.359	.430	.469	.455	.134	.145	.128	.004	.119	.174
SAT-Primary 1 -- Spring '85														
English														
Vocabulary		.524	.815	.486	.317	.513	.502	.723	.267	.236	.269	.158	.191	.215
Rdg.Comprehension			.921	.586	.423	.540	.595	.833	.255	.255	.249	.091	.126	.150
English Total				.622	.434	.603	.635	.898	.296	.282	.292	.134	.172	.200
Math														
Concepts of No.					.618	.736	.916	.855	.209	.204	.205	-.008	.080	.082
Computation						.565	.833	.707	.154	.171	.147	-.068	.037	.068
Applications							.864	.815	.274	.265	.270	.046	.113	.142
Math Total								.910	.240	.241	.234	-.014	.086	.107
English + Math Total									.295	.288	.290	.064	.142	.170
English SOPR														
Total										.927	.996	.304	.195	.254
Comprehension											.888	.257	.169	.238
Speaking -- total												.308	.197	.252
Parents' use of English													.340	.392
Parents' education (Composite B)														.851
Socioeconomic status														

*Correlations in this table have been extracted from Table E.4a.

TABLE 10.9b. Intercorrelations among some predictive control variables: Cohort B, Grade 3*

Based on LM-LEP students

	Stanford Achv.Test - Primary 2 - Fall '84								Stanford Achv.Test - Primary 3 - Spr.'85								English SOPR			Characteristics of home and parents		
	ENGLISH			MATH				Total	ENGLISH			MATH				Total						
	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Total	English + Math	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Total	English + Math	Total	Comprehension	Speaking	Parents' Use of English	Parents' Education	SES
Raven SPM	.202	.346	.338	.452	.350	.305	.462	.463	.186	.337	.322	.462	.352	.432	.479	.461	.138	.123	.137	-.052	.007	.028
SAT-Primary 2 - Fall '84																						
English																						
Vocabulary		.461	.766	.380	.170	.463	.387	.613	.561	.471	.566	.325	.151	.338	.302	.460	.396	.329	.400	.260	.239	.271
Rdg. Comp.			.924	.523	.350	.516	.536	.786	.440	.727	.708	.495	.372	.559	.544	.682	.471	.419	.469	.114	.165	.201
English Total				.543	.327	.574	.556	.834	.561	.730	.758	.499	.335	.551	.523	.693	.512	.446	.512	.195	.223	.262
Math																						
Concepts of No.					.572	.709	.880	.836	.357	.495	.505	.677	.500	.574	.662	.666	.312	.282	.309	.002	.067	.081
Computation						.507	.830	.703	.138	.351	.314	.537	.628	.493	.643	.564	.176	.175	.170	-.095	-.007	-.004
Applications							.854	.834	.450	.508	.550	.595	.433	.582	.609	.652	.388	.345	.386	.070	.114	.119
Math Total								.922	.360	.524	.527	.703	.616	.641	.748	.732	.336	.308	.332	-.014	.065	.073
English + Math																						
Total									.500	.687	.702	.698	.564	.682	.740	.808	.461	.412	.459	.082	.148	.174
SAT-Primary 3 - Spr.'85																						
English																						
Vocabulary										.527	.776	.390	.178	.407	.361	.598	.376	.327	.376	.231	.198	.208
Rdg.Comp.											.945	.536	.434	.642	.614	.840	.431	.373	.432	.140	.138	.184
English Total												.548	.390	.633	.595	.853	.465	.402	.466	.194	.179	.216
Math																						
Concepts of No.													.597	.689	.853	.809	.261	.230	.261	.016	.070	.100
Computation														.597	.889	.746	.142	.127	.141	-.049	-.019	-.028
Applications															.875	.863	.257	.230	.256	.006	.083	.086
Math Total																.927	.247	.219	.246	-.014	.046	.054
English + Math																						
Total																	.377	.330	.377	.082	.115	.138
English SOPR																						
Total																						
Comprehension																		.897	.993	.226	.216	.275
Speaking - Total																			.839	.176	.165	.216
																				.232	.223	.281
Parents' use of English																						
Parents' education(Composite B)																					.383	.418
Socioeconomic status																						.862

*Correlations in this table have been extracted from Table E.4b.

Achievement test scale, while the SOPR's correlation with the SAT scales is considerably higher.[1] This finding suggests that in many analyses SOPR and Raven combined may provide almost as effective a control as the SOPR-and-Raven-and-SES combination. And when other control variables (such as SAT pretest in Cohort B) join Raven and SOPR, the potential contribution of SES may be virtually wiped out.[2]

As for the other two home-and-family variables shown in Table 10.9a and 10.9b, parents' education and use of English in the home, the empirical data for the former are quite similar to those for socioeconomic status. This is hardly surprising since parents' education is one of the two components of the SES composite used in this report (occupational status being the other). Furthermore, as has already been pointed out, education is neither as common nor as widely and freely available in many of the countries from which recent refugees came as it is in the United States. As for parents' use of English in the home, it apparently has some slight effect on the children's performance in English, particularly on the SAT vocabulary test, but the SOPR is a better predictor. However, at least in Cohort B the correlation of SOPR with parents' use of English is somewhat lower than its correlation with the SAT Vocabulary and Reading Comprehension scores, leaving the possibility intact that parents' use of English in the home may make at least a minor contribution to their children's performance on English tests in school, beyond what would be predicted from the evaluations by teachers using the English SOPR.

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[1] A word of caution is in order concerning comparisons of correlations not based on identical cases. As shown in Table E.4a and E.4b, only about 86 to 88 percent of the cases with complete data on the Raven, SAT, SOPR, and Student Evaluation Form also had data on parents' education and parents' use of English. Also, only about 55 percent of that smaller group had data on SES. Thus any interpretations based on comparison of correlations involving any of the three home-and-family variables with other correlations, and especially any comparison of correlations involving SES with correlations not involving that variable, must be regarded as only tentative.

[2] Readers familiar with the fact that traditionally SES has been found to be correlated with achievement may wonder why its potential role in the present study may be so minimal. We surmise that this is to a large extent a direct consequence of the special nature of the group. In mainstream America there is a tendency for more able members of the population to also be better educated, and to raise their socioeconomic status. There is also a parallel tendency for parents at a higher socioeconomic level to provide their children with environmental advantages that parents at a lower socioeconomic level cannot afford or habitually do not provide. Some of these advantages are of a sort that may help the children to do better in school. But in a group such as the subjects of this study, children who come from a foreign-language background and who therefore have only a very limited knowledge of English, the parents may have come from countries where even those with high levels of native ability have little or no access to education and little or no opportunity to improve their status in life (except, perhaps, by emigrating). Furthermore, in those sectors of the immigrant population that consist largely of refugees, the disruption in the lives of those who were in the middle or upper class in their native land is quite likely to result in their finding themselves at a much lower level in the United States--at least in their early years here. All these considerations can be expected to join to make socioeconomic status a less useful predictor variable or control variable for the families of LM-LEP children--and particularly for the refugee families--than it customarily has been found to be for a more general population of Americans. (See also footnote 1 above.)

In summary, the intercorrelations suggest that though students' test performance shows some relationship to the three home-and-family variables discussed in this section, the contribution of these three variables is almost entirely incorporated in the Raven-and-SOPR combination. Thus the Raven and SOPR combination seems to provide a better prediction of school achievement, and thus will probably play a much larger role as control variables in the data analyses to determine the effectiveness of various patterns of instructional services than will the home-and-family variables.[1]

10E.2 CONCLUSION

Overall, the results of the first year of data collection indicate the study design is working well. Schools and school personnel continue to be quite supportive, and the size and characteristics of the data base are consistent with the analytic plans.

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[1] Nothing in the foregoing discussion is intended to depreciate the important role of parents in affecting their children's achievements. What is intended is to suggest that these parental effects have already shown themselves in the children's Raven scores, in those aspects of the children's use of English that affect the way teachers will rate them on the SOPR, and in other aspects of the children's performance in school.

Of course, not all has been entirely smooth and not all the data are precisely as we would have wished. As we knew it would be, student mobility has been and will continue to be a problem and a concern. Our projected overall attrition rate of up to 20 percent per year seems to have been reasonably accurate; but we would prefer to have been pleasantly surprised. Also, as is perfectly logical, but from a research perspective unfortunate, there were systematic differences among types of students receiving different types of services. Our data indicate that students with lower academic aptitude and lower levels of English language oral proficiency were more likely to be receiving services including the use of the native language. Although our analytic approach will control for these differences, comparisons between service groups will necessarily be more complex than if there had been random assignment to groups.

All things considered, however, the number and diversity of students in our study and the diversity of instructional approaches they receive sustain our initial optimism about the contributions this study can make to improving the education of LM-LEP students.

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APPENDICES

APPENDIX A: Glossary

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APPENDIX A

GLOSSARY

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Appendix A: GLOSSARY

Part 1. ABBREVIATIONS AND SPECIAL TERMS

Term	Meaning
Academic instruction	Used in discussion of instructional services to refer to math, science, social studies, and ethnic heritage instruction as distinct from instruction in language arts or other subjects.
Adjusted score	A test score corrected for omitted items by adding to the number of items answered correctly a value equal to the quotient obtained when the number of items omitted is divided by the number of options per item.
Chinese language students	LM-LEP students whose native language is Chinese.
Cluster	A set of LM-LEP instructional services received by a student at a given time and defined in terms of the following five characteristics: (1) Percentage of use of the child's native language, in instruction in subjects other than language arts. (2) Whether special instruction in English is provided. (3) Whether simplified English is used more than regular English in instruction in math, science, social studies and ethnic heritage. (4) Whether simplified English is used more than regular English in teaching English language arts. (5) Whether instruction in native language arts is provided. There are 32 clusters.
Cluster combination	The combination of major clusters which describes the LM-LEP instructional services received by a student over a given period of time (e.g., a year, two years, or three years). There are 20 such combinations for Year 1.

Term	Meaning
Cluster sequence	The categories of LM-LEP instructional services obtained by combining cluster combinations that represent essentially the same instructional services in the same order. There are 9 cluster sequences for Year 1.
Cohort A	The students in the study who were in grade 1 in the fall of 1984. Cohort A includes three categories of students: LM-LEP, EP/LIS, and EP/Comp.
Cohort B	The students in the study who were in grade 3 in the fall of 1984. Cohort B includes three categories of students: LM-LEP, EP/LIS, and EP/Comp.
CPM	Raven Coloured Progressive Matrices (This was the level of the Raven Progressive Matrices Test used in grade 1.)
DK	Don't Know (Response to questionnaire item)
EP	English-proficient
EP/Comp*	English-proficient students: Comparison group (The comparison group is a sample of students who were never classified as LM-LEP and were not receiving LM-LEP instructional services.)
EP/LIS*	English proficient students receiving LM-LEP instructional services
ESL	English as a Second Language
LEP	Limited-English-proficient (This term is sometimes used to mean LM-LEP.)
LM	Language minority
LM-LEP*	Language-minority limited-English-proficient
Major cluster	The six major categories into which the 32 clusters are classified.
"Other language students"	LM-LEP students whose native language is neither Spanish nor Chinese.

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*This category of students in the study consists of students who met the definition as of fall 1984.

Term	Meaning
Raven	Raven Progressive Matrices Test Different levels were used in grades 1 and 3--the CPM level in grade 1 and the SPM level in grade 3.
Rights score	A test score equal to the number of items answered correctly.
SAT	Stanford Achievement Test
S.D.	Standard deviation
SEF	Student Evaluation Form This is the form used by teachers at the end of the year to rate students in the study, with respect to their proficiency in various aspects of English, math, and native language.
Services	When this term is used in the report, it refers to instructional services for LM-LEP students.
Service cluster	When this term is used it refers either to the "cluster" as defined above, or to the "major cluster."
SES	Socioeconomic status
SOLOM	Student Oral Language Observation Matrix This is a rating scale developed under the auspices of the California Department of Education.
SOPR	Student Oral Proficiency Rating This is a slight modification of the SOLOM, for use in the present study. There are two forms of the SOPR-- one for English and one for the student's native language. As in the SOLOM, students are rated in five aspects of spoken language: (1) comprehension, (2) fluency, (3) vocabulary, (4) pronunciation, and (5) grammar.
Spanish language students	LM-LEP students whose native language is Spanish.
SPM	Raven Standard Progressive Matrices (This was the level of the Raven Progressive Matrices used in grade 3.)

Part 2. STATISTICAL NOTATION

f	Frequency
M	Mean
N	Number of cases
n	Number of items in test
c	Number of choices per multiple-choice item
S.D.	Standard deviation
r_{jk}	Correlation between variables j and k (Unless otherwise specified it is the Pearson product-moment coefficient.)
r_{ii}	Reliability of variable i
$\overline{X}$	Mean of variable X
s	Standard deviation of sample (This is the standard deviation obtained using N as the divisor.)
s_x	Value of s for variable X
σ	Estimate of population standard deviation (This is the standard deviation obtained using N-1, or number of degrees of freedom, as the divisor.)
σ_x	Value of σ for variable X
R	Rights score (i.e., number of test items answered correctly)
O	Number of test items omitted
A	Number of test items attempted
I	Adjusted score (i.e., score adjusted for omitted items)

APPENDIX B

DESCRIPTION OF SELECTED COMPOSITE SCORES AND OTHER VARIABLES

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Appendix B: DESCRIPTION OF SELECTED COMPOSITE SCORES AND OTHER VARIABLES

B1

1. SOCIOECONOMIC INDEX

This composite is a weighted sum of two components--occupational status of parents and parents' education--which are described in Sections 2 and 3 respectively of this appendix. The raw values on occupational status are weighted 3 and the parents' education is weighted 1. This results in an "effective weight" of approximately 5 for status and 4 for education. Table B.1 shows the relevant data.

B2

2. OCCUPATIONAL STATUS OF PARENTS

Occupational status of parents is rated on a five-point scale, shown in Table B.2.

B3

3. PARENTS' EDUCATION--A

This is an unweighted average of number of years of schooling for the father and the mother, with a scale value of 14 representing 14 or more years. If data are missing for one parent, the value used is the number of years for the other parent.

This composite ("parents' education composite A") is described in Chapter 3, Section E, and is used in Tables 3.10 and 3.11. It is the composite used in determining socioeconomic status; it differs slightly from parents' education composite B (see Section 4 below), which is used in certain tables in Chapters 4 and 8.

TABLE B.1. Descriptive data for socioeconomic status and its component variables

Based on LM-LEP students in Cohorts A and B
N = 4145

		$\overline{X}$	σ	Range	Weights in SES Raw wt.* (w)	 Approx. effective wt.**
Parents' education:	Composite A	7.962	3.532	0-14	1	5
Occupational status		2.040	.936	1-5	3	4
Socioeconomic index		14.081	5.292	3-29	-	-

*The raw weight is the weight actually applied in computation.

**The effective weight = $kw\sigma$, where k is a constant.
For these data, k was set at 1.42, to give approximately integral values for the effective weight.

TABLE B.2. Occupational status codes

Rating	Professionals	Proprietors, Managers, and Business Persons	Commercial Workers Clerks, Etc.	Manual Workers	Protective and Service Workers	Farm Workers
5	Doctors, lawyers, dentists, engineers, judges, architects, school superintendents, chemists, psychologists, professors	Owners or managers of large businesses (10 or more employees), regional or divisional managers of large financial or industrial enterprises				Owners or managers of large farms (equiv. of 10 or more full-time employees)
4	Teachers, registered nurses, undertakers, newspaper reporters, social workers, chiropractors, artists, authors, accountants, dietitions, airline pilots, musicians.	Owners or managers of moderate-sized businesses (3-9 employees), assistant managers, department managers, etc. of large businesses, store buyers.	Stock brokers, real estate and insurance salespersons, wholesale salespersons		Military, police, and fire senior officers (lieutenants and above)	Owners or managers of medium-sized farms (3-9 employees)
3	Foresters, religious workers, photographers, recreation workers, dance teachers, sports officials, athletes, surveyors, medical technicians, flight attendants, draftsmen	Owners or managers of small businesses, minor officials of businesses, floor managers, contractors	Auto salespersons, bank tellers, executive secretaries	Factory foreman, electricians, plumbers, carpenters, watchmakers, machinists, steel workers, welders, jewelers, masons	Military, police, and fire middle officers (sergents, corporate), auto mechanics	Owners or managers of small farms
2			Typists, file clerks, receptionists, telephone operators, cashiers, library assistants, sales clerks	Apprentices to carpenters, plumbers, and electricians, telephone lineman, bakers, painters	Military, police, and fire persons, practical nurses, bartenders, waitresses, night watchmen, truck drivers, butchers, cooks, barbers, hairdressers, teachers' aides, cab drivers	Tenant farmers, full-time farm workers, ranch hands
1				Sewing machine operators, laborers, assembly line workers maids	Janitors, nurses' aides, messengers, gas station attendants, gardeners,	Migrant farm workers

B4 4. PARENTS' EDUCATION--B[1]

This is a weighted average of the number of years of schooling the parents have had, with a scale value of 14 representing 14 or more years and with the more educated parent having triple weight. If data are missing for one parent the value used is the number of years for the other parent.

This composite is used in Tables 4.16, 8.8a, 10.1a, 10.1b, E.4a, and E.4b.

B5 5. PARENTS' USE OF ENGLISH IN THE HOME--A

This is a composite, used in Chapters 4, 8, and 10, of the responses to two questions in the Parent Questionnaire: (1) What languages does the mother speak at home? and (2) What languages does the father speak at home?

Responses to each question were scored as follows:

- 2 points if only English was indicated
- 1 point if English and another language were indicated
- 0 points if a non-English language, but no English, was indicated.

The composite score is obtained by adding the scores for mother's languages and father's languages. This gives a 5-point score scale, running from 0 (no English) to 4 (all English). If data are missing for one parent, the value for the other parent is doubled, so that 0, 1, or 2 becomes 0, 2, or 4.

This composite is used in Tables 4.16, 8.8a, 10.1a, 10.1b, E.4a, and E.4b.

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[1] Although the correlations between composites 3 and 4 have not been obtained, they are undoubtedly very high.

B6 6. PARENTS' USE OF ENGLISH IN THE HOME--B[1]

This variable, which differs slightly from the one described in section 5 above, is described in Chapter 3, Section E, and is used in Tables 3.10 and 3.11.

B7 7. READING MATTER IN THE HOME

The three composite variables on reading matter in the home refer to only two kinds of reading matter: newspapers and magazines. The composites are based on responses to four questions in the Parent Questionnaire, which ask which of the following types of reading matter are received regularly:

a. English language newspapers
b. English language magazines
c. Newspapers in a language other than English
d. Magazines in a language other than English

- Reading matter composite 1. Non-English materials

  Responses to questions c and d above are each scored 1 (Yes) or 0 (No). The score is the sum of the response scores for the two items.

- Reading matter composite 2. English materials

  Same as composite 1 (above) except that items a and b are used instead of c and d.

- Reading matter composite 3. Total

  This is the sum of composites 1 and 2 (above).

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[1] Although the correlations between composites 5 and 6 have not been obtained, they are undoubtedly very high.

8. STUDENT ORAL PROFICIENCY RATING (SOPR) SCALES

DIRECTIONS: For each of the 5 categories below at the left, mark an "X" across the box that best describes the student's abilities.

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
A. Comprehension	Cannot understand even simple conversation.	Has great difficulty following what is said. Can comprehend only "social conversation" spoken slowly and with frequent repetitions.	Understands most of what is said at slower-than-normal speed with repetitions.	Understands nearly everything at normal speed, although occasional repetition may be necessary.	Understands everyday conversation and normal classroom discussions without difficulty.
B. Fluency	Speech is so halting and fragmentary as to make conversation virtually impossible.	Usually hesitant; often forced into silence by language limitations.	Speech in everyday communication and classroom discussion is frequently disrupted by the student's search for the correct manner of expression.	Speech in everyday communication and classroom discussion is generally fluent, with occasional lapses while the student searches for the correct manner of expression.	Speech in everyday conversation and in classroom discussions is fluent and effortless, approximating that of a native speaker.
C. Vocabulary	Vocabulary limitations are so extreme as to make conversation virtually impossible.	Misuse of words and very limited vocabulary make comprehension quite difficult.	Frequently uses the wrong words; conversation somewhat limited because of inadequate vocabulary.	Occasionally uses inappropriate terms or must rephrase ideas because of inadequate vocabulary.	Use of vocabulary and idioms approximates that of a native speaker.
D. Pronunciation	Pronunciation problems so severe as to make speech virtually unintelligible.	Very hard to understand because of pronunciation problems. Must frequently repeat in order to be understood.	Pronunciation problems necessitate concentration on the part of the listener and occasionally lead to misunderstanding.	Always intelligible, though one is conscious of a definite accent and occasional inappropriate intonation patterns.	Pronunciation and intonation approximate a native speaker's.
E. Grammar	Errors in grammar and word order so severe as to make speech virtually unintelligible.	Grammar and word order errors make comprehension difficult. Must often rephrase or restrict what is said to basic patterns.	Makes frequent errors of grammar and word order which occasionally obscure meaning.	Occasionally makes grammatical or word order errors which do not obscure meaning.	Grammatical usage and word order approximate a native speaker's.

This form is an adaptation of the Student Oral Language Observation Matrix (SOLOM) developed by the San Jose (California) Unified School District.

The above chart is a reproduction of the five rating scales used in both the English SOPR and the native language SOPR. As indicated by the "levels," students are rated 1-5 on each scale. Total score on each of the two SOPRs is the sum of the ratings for scales A, B, C, D, and E.

APPENDIX C

STUDY IMPLEMENTATION IN YEAR ONE

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Appendix C: STUDY IMPLEMENTATION IN YEAR ONE

C1

1. INTRODUCTION

This Appendix supplements the discussion contained in Chapter 2 of the report. Included is a brief discussion of how the student sample was obtained, how field operations were organized and staffed, and how the major data collection instruments were administered during the study's first year.

During the first year of the study, site visits were made to each participating school district. The first visit took place in the fall of 1984. Its purpose was to familiarize principals with the study, to compile rosters of the study students, to identify teachers and support staff working with study students at each school, and, where required, to send home parent permission forms.

Following the initial visit, the 18 participating districts were visited for data collection in the fall, winter, and spring. The fall data collection visits by the team leaders and onsite data collectors took place between early October and late December. The fall data collection required an average of two weeks per school district or site. The winter site visits were conducted in late January and early February with data collection teams spending an average of one week per school district. The spring round of site visits to all 18 participating districts began in mid-April, and were completed by early June; approximately two weeks were spent at each site.

A total of 18 data collection instruments were used in Year 1 of the study. They included measures of academic achievement and aptitude, teacher ratings of student language and academic performance, individualized instructional data, and teacher, principal, school and district information.

C2 2. OBTAINING THE STUDENT SAMPLE

C2.a DEFINITION OF LM-LEP AND EP STUDENTS

In the fall of 1984, language-minority limited-English-proficient (LM-LEP) and English proficient (EP) students in the first and third grades at each study school were selected. For the study, a LM-LEP student is defined as a child from a language minority group who has been identified by local school or district staff to be unable to benefit from academic instruction provided solely in English.

A great deal of variation was found in the procedures used by schools and school districts to identify LM-LEP students. Some had very specific criteria detailing how such students should be identified, while others had no set procedures, relying mainly on school administrators or teachers to designate LM-LEP status.[1]

In most districts, the testing and other procedures for determining which students were to be classified as LM-LEP had not been completed by the district prior to the first fall visit by the study team. When this occurred, it was necessary to recheck each student's status during the second fall visit and reclassify, as appropriate, those students whom the school or district had recategorized.

It should be noted that those LM-LEP students who were classified as learning disabled and who were taught in self-contained classes for the learning disabled were excluded from the study sample. However, prior to the fall selection of students, several districts had not completed the classification of students as learning disabled; hence, it was necessary to subsequently verify that selected study students had not been classified as learning disabled and placed in self-contained learning-disabled classrooms. Those who had been so placed were dropped from the sample.

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[1] In school districts where there were no set procedures, it often took considerably longer to reach agreement about which students should be included in the study because there were often disagreements among school or district staff as to which students should be designated LM-LEP.

Two types of English-proficient (EP) students were selected for inclusion in the study. Both groups are students designated as English-proficient according to criteria used by the individual school or school district.

The first type of EP students selected for the study were students receiving LM-LEP services in first and third grade. They were designated as EP/LIS. These students receive services for several different reasons. For some, it is the only instructional program offered or parents have requested the services. For others, school administrators and/or teachers have placed the student in the program to serve as role models.

The second set of EP students included in the study sample were the EP/Comp group. They are native English speakers, never classified as LM-LEP, and not receiving special LM-LEP services. During the fall of 1984 ten students from each study schools' first and third grades were selected to be part of the study sample.

C2.b PARENT PERMISSION

Written parent permission for data collection on individual students was required in seven school districts: Boston Public Schools, Chicago Public Schools, Cleveland Public Schools, Dade County Public Schools, New York Community School District 19, New York Community School District 20, and the St. Paul Public Schools. In these school districts, request forms were sent to the homes of potential study sample students (i.e., all first and third grade LM-LEP students, all first and third grade EP/LIS students, and a random sample of thirty first and thirty third grade EP/Comp students at each study school in the district). The letters sent to all EP parents and guardians were in English. Those sent to LM-LEP students' parents and guardians were in English and, where possible, in the students' native languages.[1]

The response rate to the parent permission requests differed greatly among districts, and among different schools in any one given district. In many schools the response rate was over 90 percent, with nearly all parents granting permission. On the other hand, in a few schools, fewer than 40 percent of the parents returned the forms, despite follow-up by study field staff and school employees. In those schools where the response rate was low, a second wave of parent permission request forms was sent out during the winter data collection visits. Any student whose parents returned a form granting permission was added to the student sample. Where required, students were included in the study sample only if the parent or guardian returned a completed permission form.

C2.c MID-YEAR ADJUSTMENTS TO THE STUDENT SAMPLE

In the first year of the study, as necessary and in keeping with its goals, adjustments to the student sample were made. Accommodations entailed augmenting the sample by including LM-LEP students who transferred into a study school, and adding new EP students to maintain the the EP/Comp sample at ten per grade where EP/Comp students left the school. In schools where readjustments were made in a student's status after data collection had begun (e.g. LM-LEP to EP or vice versa) students were reclassified as appropriate.

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[1] Parent permission forms were prepared in fourteen languages: Albanian, Arabic, Cambodian (Khmer), Chinese, Greek, Hindi, Italian,Korean, Portuguese, Romanian, Spanish, Tagalog, Urdu, and Vietnamese. If the student's native language was other than one of these fourteen, only an English verison of the form was sent home.

C3 3. STAFFING AND ORGANIZATION OF DATA COLLECTION

The overall supervision of the Year 1 data collection effort was the responsibility of the Project Director and the Field Coordinator. To permit more direct supervision of onsite activities and to facilitate close communication with the participating sites, nine field team leaders[1] took responsibility for each of the 18 school districts participating in the study. Each team leader oversaw the data collection activities in one to three of the school districts. They handled all communications with the district and local school officials, as well as located, hired, and supervised local professional and paraprofessional data collectors in the completion of the district and school questionnaires and administration of the Stanford Achievement Tests.

The criteria for selecting the professional data collectors were that: 1) they be experienced in gathering survey data; 2) they have experience working with elementary school children; 3) they be familiar with special services for LM-LEP students; and, 4) where possible, they be proficient in the native language(s) of the LM-LEP students at the site. Up to nine local professionals per site were employed during the fall. Their primary responsibility was to assist the team leader throughout the data collection process in updating the student and teacher rosters and in gathering the teacher and support staff data.

Paraprofessionals were generally aides or clerical staff at the study schools. They were employed mainly to assist in the collection of student background information from school records, and to help send out and keep track of parent questionnaires.

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[1] The team leaders are senior-level, full-time Development Associates employees or consultants with extensive experience conducting educational research with LM-LEP students in public elementary schools.

C4 4. ROSTERS, TESTS, QUESTIONNAIRES AND OTHER INSTRUMENTS

C4.a STUDENT AND STAFF ROSTERS

Two primary tasks of team leaders during the first fall 1984 site visit were to verify which students were to participate in the study and to identify teachers, aides, and other instructional and support staff members who were working with sample students during the 1984-85 school year. To carry out the first task of verifying study students, team leaders were provided with student roster forms. For the first fall visit, the rosters only had nine digit identification numbers printed down the left hand margin. Data collectors wrote in the student's name, birthdate, sex, native language, and parental permission status. The rosters were completed on information from school and district records.

By the second fall site visit, the information on the rosters was computerized and data collection teams were provided with pre-printed copies for each study school. Each roster contained the student's study identification number, birthdate, sex, and native language. In addition, there was space to provide the student's district (local) identification number, the name of the student's main (homeroom) teacher, and the teacher's identification number. Space was also provided for special comments about the student. The primary tasks for the data collectors during the fall visit were generally to verify that all the information provided on the rosters was correct and to fill in any missing data required. Additional identification numbers were also provided on the roster so that names and other identifying information for new students not originally included could be added.

For the winter site visits, data collectors were provided with computerized rosters essentially identical to those used in the fall. In addition to the pre-printed information on the fall rosters, the winter rosters had pre-printed district (local) identification numbers, names of main teachers, and teacher identification numbers. Rosters were arranged by grade and by sample status (LM-LEP, EP/LIS, EP-Comp). Within each roster, students were listed alphabetically by last name. As in the fall, the main tasks during the winter site visit were to verify that all the information on the rosters was correct and that all of the listed students were still in the school. If any student had left the school, the data collector was directed, if possible, to identify the school to which the student had transferred.

The rosters for the spring were identical to those provided for the winter. However, to facilitate data collection, students were grouped by main (homeroom) teacher, rather than by grade as had been done previously. Again it was the task of the data collectors to verify that all of the information on the rosters was correct, to note any changes in the main teachers of sample students, and to identify schools to which study students had transferred.

To carry out the task of identifying instructional staff members working with study students, team leaders were provided with a roster form for listing instructional staff members working with first and third grade students.

For the study, instructional staff are considered to be teachers who provide instruction in English or in the native language in content subject areas including English reading, English language arts, native language reading, native language arts, mathematics, social studies, ethnic heritage, and science. Teacher aides or other paraprofessionals, not under the direct supervision of a teacher, providing direct instruction in content subject areas are also considered to be instructional staff.

For the second fall site visit, the roster information was computerized, and pre-printed instructional staff rosters were provided to the data collection teams at each study school. The rosters had a list of each staff members' identification number and name. The primary task for the data collectors during the fall visit was to verify that the listed staff members actually taught students in the study's sample. Space was also provided on the roster to add the names of any new staff members to the school not included on the original roster and who had begun to work with students in the study's sample.

For the winter and spring site visits, the data collectors were responsible for verifying that the listed instructional staff members were still at the school, for adding the names of new instructional staff members working with sample students, and for completing other necessary information required to complete the roster.

C4.b INSTRUMENTS FOR COLLECTING INDIVIDUALIZED INSTRUCTIONAL DATA

Both the Student/Teacher Data Form and the Instructional Language Record were administered in the fall, winter, and spring. The Student/Teacher Data Form was a self-administered questionnaire. Its main purpose was to identify instructors who should complete the Instructional Language Record and the number of hours of native language instruction received by study students. Its secondary purpose was to verify student grade and language background.

Once the main study teachers had completed the Student/Teacher Data Form, the data collectors reviewed them to identify other instructional staff who should complete the Instructional Language Record, the only study instrument designed as a structured interview. To complete this instrument, field staff arranged to meet with academic subject area teachers who taught study sample students English, mathematics, science, social studies, and ethnic heritage. These meetings were held either individually or in small groups. Typically, they required at least a half-hour period.

During the meeting the data collector explained the Instructional Language Record and then selected one study student from the teacher's class roster. That student's name was written on the interview guide and then the teacher was asked about that student's course of instruction. Once the nature and amount of the individual student's instruction had been documented, the teacher then identified other study students who were receiving exactly the same instruction. The names of these students were entered on the same interview guide. For each student or group of students in the study sample not receiving the same instruction as the first student(s) described, another Instructional Language Record was completed. The process was repeated until all the variations in instructional programs of students in the study taught by any one teacher had been detailed.

C4.c PARENT QUESTIONNAIRE

Parent and guardian data for LM-LEP students only were collected during Year 1 using the Parent Questionnaire. The data collection which began in the fall of 1984 is described below.

The language minority group to which each student belonged was determined from the student roster. For each student, a packet was prepared containing one copy of the Parent Questionnaire in English and one in the students' native language[1]. These packets were distributed to the students' homeroom teachers with instructions that the students take the packet home at end of that school day and give it to their parents or guardians. The teachers were asked to urge their students to bring the form back the next day.[2]

A few days after the packets were distributed, field staff went back to each homeroom and collected those questionnaires that had been completed and returned. There was no formal follow-up other than that informally done by teachers and other school staff.

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[1] The Parent Questionnaire was translated into the following 14 languages: Albanian, Arabic, Cambodian (Khmer), Chinese, Greek, Hindi, Italian, Korean, Portuguese, Romanian, Spanish, Tagalog, Urdu, and Vietnamese. If the student's native language was not one of these, only the English version of the questionnaire was sent home.

[2] Where appropriate and on teacher recommendation, whole classrooms were offered a reward for 100% return of completed Parent Questionnaires (e.g., an ice cream cone for each student in the class).

During the winter and spring data collections, field staff again checked with homeroom teachers and collected any additional completed Parent Questionnaires which had been returned. For those parents or guardians who had not returned a form, a second Parent Questionnaire packet was sent home with the student. Again, there was generally no additional follow-up by field staff.

C4.d OTHER DATA COLLECTION FORMS

Policy and school background information were collected using several measures. The data collection instruments used were: the District Policy Questionnaire, the Programs and Procedures interview, the Principal Questionnaire, the Instructional Staff Questionnaire.

Through the District Policy Questionnnaire information related to the following issues was collected: entry/exit, placement of students after exiting from special services for LM-LEP students, parental involvement, the use of the students native language for instruction, the credentialling and English proficiency requirements of the instructional staff members who provide services to LM-LEP students, the administration of standardized achievement tests to LM-LEP students, the integration of LM-LEP students with EP students, the use of pull-out for the delivery of special services for LM-LEP students, the follow-up of former LM-LEP students after exit from special services, and the provision of pre- and in-service education specially designed for teachers of LM-LEP students.

A Programs and Procedures interview was conducted with the person in the school most knowledgeable about services provided to LM-LEP students. This interview concerned the types of services provided, entry and exit procedures and criteria for such services, and other factors (availability of staff, etc.) affecting the provision of services. This interview was conducted during the spring data collection.

The principals of each school were asked to complete a questionnaire during the spring site visit. Through the Principal Questionnaire data on the principal's basic academic preparation, educational philosophy, and attitudes toward the use of a language other than English in the academic situation were collected.

Basic information about instructional staff were gathered through the Instructional Staff Questionnnaire. This questionnaire was completed during the fall visit by all the teachers of study students. As with the principal questionnaire, information was gathered on the staff members' basic academic preparation, educational philosophy, instructional practices, and use of a language other than English for instructing LM-LEP students.

Classroom observations were carried out in the first year in 11 schools within four of the 18 study sites. The schools at these sites served primarily Spanish-speaking students and were selected to include a range of service cluster types. A total of 109 teachers were observed while providing instruction to students in English language arts. The observations were carried out to obtain further information on student and teacher language use during English language arts instruction and on the classroom learning environment. The observers were individuals with elementary school teaching experience who were fluent in the students' native language. They were trained in a two-day training session that involved observation of videotaped classroom instruction and observation in actual classrooms.

In each school where observations were done, all teachers who taught at least two hours of English language arts to five or more study students were observed during a thirty-minute English language arts lesson. The observations were scheduled so that the lessons observed involved presentation of new instructional material or of new activities. Sixteen of the 109 teachers were observed by a second observed on a different day for the same subject area. These duplicate observations were conducted to provide reliability data.

C4.e DOCUMENT REVIEW FORMS

The School Summary Form was used to collect basic information about each study school. The data collected through this instrument included neighborhood socioeconomic status, school enrollment, native language groups represented in each school, pre- and in-service teacher training provided, relative academic standing of LM-LEP students as compared to EP students in the school, and school grading scales.

The Student Background Questionnnaire (parts A through C) was designed to be completed through data on individual students which was available from school and district records. Part A focused on student data related to ethnicity, history of receipt of special instructional services, the language of instruction, student learning disabilities, free lunch, absenteeism rates, and receipt of migrant education services. These data were gathered from students' cumulative records and were collected on site during the fall of 1984. Part B was used to verify student information collected in the fall. It was completed on site during the spring of 1985.

Part C was used to collect CTBS Espanol math, and Spanish reading achievement test data in those districts where these measures were administered. The data were obtained through central district office records or from individual student records at the schools. These data were collected in eight of the eighteen districts in the study. Where possible, 1984 results on oral proficiency tests such as the Language Assessment Scales and Language Assessment Battery were also obtained. These data which will be compared with the SOPR ratings were gathered in five of the study districts.

C4.f THE RAVEN PROGRESSIVE MATRICES

The rationale for using the Raven Progressive Matrices is provided in Chapter 2. The intent here is to provide basic information related to the procedures used in implementing the measure.

Test administrators with background in elementary education (either through teaching, research, or graduate study) and with actual experience working with elementary grade level children were identified and hired at each site. They were trained on site by one of three regional trainers. The lead trainer, who had extensive prior experience in working with the Raven, developed the training package and was responsible for instructing the two additional trainers.

The test administrators were instructed in a one day session in the procedures for administering the Raven. Part of the training required that each trainee administer the measure to an actual group of students or that he or she participate in a mock testing session under the direct supervision of the trainer. The test administrators were trained to give the test in pantomime while providing verbal instructions in English or in the children's native language.[1]

The pantomime instructions were given using a specially designed display board, with movable pieces, representing an enlarged replica of the first example in the test booklet. The verbal explanation was presented in simple English or in a student's native language or both, as appropriate.

Once trained, each test administrator contacted the principals of the schools for which they were responsible. With them they arranged the testing procedures i.e., defined who was to be tested, identified where the testing would occur, established the number of students to be tested at one time, confirmed whether students would be released individually or in a group once they completed the test.

On the average, each testing session required approximately 30 minutes for first graders and about 45 minutes for third graders. Both first and third graders marked their responses using the answer sheets developed for the study.

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[1] The rationale for using both pantomimed and verbal instructions was based on the on a judgment that the use of both would help to make the students feel more comfortable with the situation, as well as provide the most complete information for making the test directions understood.

C4.g THE STANFORD ACHIEVEMENT TEST (SAT) SUBTESTS

The SAT tests were administered where possible by the students' own teachers, or other school staff members with whom the students were familiar Those who did the testing were provided with an instructional package and were trained by the team leader. In those cases where teachers or other school staff members were not available, the SATs were administered by the field staff who were also trained in the testing procedures.[1]

Arrangements were made with school principals for a classroom or other room in the school (e.g., gymnasium, cafeteria) where students could be brought together in groups of no more than 25 for the test administration.

When students missed particular subtests or the entire set of subtests due to absence, the data collector made follow-up contacts with the school to determine when the student returned to school to arrange a time and place for a make-up session. If any student missed a subtest or subtests, or was excused from the testing, teachers were required to record this information on a special log.

Principals and teachers were encouraged to test all LM-LEP students; however, students whose English was either nonexistent or so limited that it was believed that they would not understand how to take portions of the test were exempted from the particular parts of the SAT with which it was felt they could not cope. If teachers believed the students to be particularly limited in English, and thus excluded them from taking the reading subtests, they were strongly encouraged to have students take the math subtests because these, it was believed, could be handled effectively by students who could not read English. The teacher ultimately made the decision as to who would or would not be tested.

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[1] First graders were tested with the Stanford Achievement Test, Primary 1, Form F, in the spring. Third graders were assessed in the fall and spring. In the fall the Stanford Achievement Test, Primary 2, Form E was used; in the spring, the Stanford Achievement Test, Primary 3, Form F was used.

C4.h THE STUDENT ORAL LANGUAGE PROFICIENCY RATING (SOPR) FORM

LM-LEP students were rated for English and native language proficiency using the Student Oral Language Proficiency Rating form (SOPR). EP students receiving services for LM-LEP students and EP/Comp students were not rated because it was assumed they were proficient in English. SOPR ratings were obtained on each student in the fall, or during the winter data collection period if the student had not been added to the study sample until after the fall site visits.

Students were rated for oral proficiency in English by teachers who taught the students in English and who themselves were proficient English speakers. Main teachers, aides or other school staff members working with students and fluent in the student's native language rated the student's native language oral proficiency. If there were no staff members in the school who both worked with the students and who were fluent in their native languages, no native oral language proficiency ratings were obtained. All teachers asked to rate a student on the SOPR were provided training in the use of the SOPR.

In the training session raters were instructed to judge a student's oral proficiency on the basis of their familiarity with the student's language usage in the past; that is, raters were not to interview or otherwise make a special effort to elicit oral speech either in English or in the native language when rating the student. The rating form itself consisted of a single page on which there was a twenty-five box matrix. The matrix was formed of five rows, each of which contained five categories. On this matrix, raters indicated their judgment of the student's pronunciation, fluency (use of correct intonation and sentence rhythm), grammatical usage, vocabulary, and general ability to comprehend oral language. For each area, the student was rated according to five levels of approximation of oral language proficiency to that of a native speaker of the language of the same age and grade, with a five being equivalent to the oral language proficiency of a native speaker and a one being equivalent to no oral proficiency in the language being rated.

APPENDIX D

TECHNICAL APPENDIX ON RAVEN PROGRESSIVE MATRICES TEST

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Appendix D: TECHNICAL APPENDIX ON RAVEN PROGRESSIVE MATRICES TEST

As discussed in Chapter 2, the Raven Progressive Matrices was administered to all students in the study because a measure of academic ability operationally independent of knowledge of the English language was needed.

D1 1. RANGE OF SCORES

As shown in Table 4.13, which presents distributions of adjusted scores on the Raven total, the scores have a very wide range, not only for the English-proficient groups but also for the LM-LEP students, extending from 1 (a below-chance score) to 36 (a perfect score), in Cohort A; the Cohort B range is from 3 (a below-chance score) to 51 (out of a possible 60). The fact that the range runs from very low to very high, but without a conspicuous bunching of students at either extreme, helps confirm that the Raven CPM is appropriate for our grade 1 sample and that the SPM is appropriate for grade 3.

D2 2. COMPARING ADJUSTED SCORES AND RIGHTS SCORES

The ranges are identical for the adjusted scores and the rights scores. This raises the question of whether the adjustment process really makes a difference. The best way to answer this question is to look at the distributions of number of omitted items (Table D.1). In each cohort approximately 2 percent of the students (certainly not a negligible proportion) omitted enough items to have their scores raised at least a point by the adjustment process; and some of the students had their score raised by as much as 5 points (in grade 1) or 8 points (in grade 3)--which amounted to almost a standard deviation each. Thus for about 98 percent of the students their adjusted score equals their number right; for the other 2 percent using the

TABLE D.1. Distribution of number of items omitted in Raven, for each group in each cohort

No.of items omitted	NO. OF CASES			NO. OF CASES		
	Cohort A, Grade 1			Cohort B, Grade 3		
	LM-LEP	EP/LIS	EP/Comp	LM-LEP	EP/LIS	EP/Comp
60				--	--	1
59				--	--	--
58				--	--	--
57				--	--	--
56				--	--	--
55				--	--	--
54				--	--	--
53				--	--	--
52				--	--	--
51				1	--	--
50				--	--	--
49				--	--	--
48				1	--	--
47				--	--	--
46				--	--	--
45				--	--	--
44				--	1	--
43				--	--	--
42				--	--	--
41				--	--	--
40				--	--	--
39				--	--	--
38				--	--	--
37				--	--	--
36	--	--	--	--	--	1
35	--	--	--	--	--	--
34	--	--	--	1	--	--
33	--	--	--	--	--	--
32	--	--	--	--	--	--
31	--	--	--	--	--	--
30	--	--	--	--	--	--
29	1	--	--	--	--	--
28	--	1	--	--	--	--
27	--	--	--	1	--	--
26	--	--	--	--	--	--
25	1	--	--	--	--	--
24	1	--	--	1	--	1
23	--	--	--	--	--	--
22	--	--	--	--	--	--
21	--	--	--	--	--	1
20	--	--	--	3	--	--
19	--	--	--	2	--	1
18	--	--	--	--	--	--
17	--	--	--	3	1	--
16	1	--	--	--	--	--
15	--	--	--	--	--	--
14	4	--	--	--	--	1
13	7	--	1	--	2	--
12	25	1	--	4	1	--
11	1	--	1	1	--	--
10	2	--	--	--	2	--
9	1	--	--	2	--	1
8	1	--	1	2	--	--
7	4	--	--	7	--	--
6	8	3	1	--	--	--
5	5	--	1	11	--	--
4	5	1	--	7	--	1
3	16	2	1	8	2	3
2	83	10	6	55	8	4
1	368	59	41	308	48	35
0	4136	652	391	2576	555	353
N	4670	759	444	2994	620	403
Mean	.277	.194	.223	.334	.305	.593
S.D.	1.427	1.227	1.027	2.014	2.182	4.022

adjustment procedure gives a more accurate representation of what the student's score would be if he(she) had followed instructions to answer every item. We feel that this is ample justification for using the adjusted score in the data analysis. Tables D.2a and D.2b provide further evidence in support of use of the adjusted scores. As shown in these tables the correlations of number of items omitted with adjusted scores, though negative, are numerically very low. The significance of this lies in the fact that the closer the correlation between number of items omitted and adjusted score (or rights score) is to +1 or -1, the less difference it makes whether the score adjustment procedure is used. It is worth mentioning, however, that apparently the 2 percent whose score changed, and even the much smaller proportion whose scores changed substantially are not sufficient to have much effect on the correlation between adjusted score and rights score; the correlation, based on 5,873 LM-LEP cases, was .9993(!) for grade 1; for grade 3 the corresponding correlation, based on 4,017 cases, was .9994. Perhaps the best interpretation of these extremely high correlations lies in concluding that the correlation coefficient is not a sensitive enough statistic to reflect large departures from equivalence for small numbers of cases. That might, in some contexts, be regarded as a deficiency of the correlation statistic itself, but it is not a deficiency of the adjusted score formula.

D3

3. THE 24-ITEM OVERLAP BETWEEN CPM AND SPM

Every item in a test of academic aptitude should become easier as the child advances from grade to grade. For instance if the same items are given to grade 1 and grade 3, the grade 3 children should tend to score higher. The fact that 24 of the 36 items in the SPM (given to grade 3) are identical to 24 of the 60 items in the CPM (given to grade 1) with the trivial exception that in the CPM the items are in colored ink while in the SPM they are in black and white enables us to confirm that the Raven meets this requirement. Table D.3 shows the Cohort A and Cohort B distributions of the 24 overlapping items, for LM-LEP students, along with means and standard deviations. The increase in means from grade 1 to grade 3 is

TABLE D.2a. Intercorrelations among Raven CPM part scores (adjusted), Raven total (adjusted), and number omitted

LM-LEPs, Cohort A, Grade 1

N = 4670

	CORRELATIONS					
	Adjusted scores			No.		
	A+B	AB	Total	omitted	Mean	S.D.
Sets A+B		.659	.938	-.140	12.305	3.667
Set AB			.880	-.103	5.943	2.683
Total				-.136	18.248	5.798
No. omitted					.277	1.427

TABLE D.2b. Intercorrelations among Raven SPM part scores (adjusted), Raven total (adjusted), and number omitted

LM-LEPs, Cohort B, Grade 3

N = 2994

	CORRELATIONS					
	Adjusted scores			No.		
	A+B	C+D+E	Total	omitted	Mean	S.D.
Sets A+B		.670	.874	-.086	15.415	3.983
Sets C+D+E			.946	-.032	9.873	6.002
Total				-.058	25.289	9.162
No. omitted					.334	2.014

TABLE D.3. Distribution of Raven adjusted scores on scales A+B
(RPM Grade 1 and SPM Grade 3)

Raven	CPM - Grade 1		SPM - Grade 3	
A+B	f	%	f	%
24	6	.1	25	.8
23	16	.3	49	1.6
22	24	.5	130	4.3
21	52	1.1	144	4.8
20	75	1.6	184	6.1
19	86	1.8	193	6.4
18	141	3.0	216	7.2
17	195	4.2	234	7.8
16	283	6.1	289	9.7
15	305	6.5	274	9.2
14	444	9.5	280	9.4
13	485	10.4	240	8.0
12	507	10.9	227	7.6
11	577	12.4	187	6.2
10	500	10.7	138	4.6
9	349	7.5	73	2.4
8	254	5.4	48	1.6
7	151	3.2	25	.8
6	95	2.0	13	.4
5	50	1.1	12	.4
4	38	.8	6	.2
3	20	.4	4	.1
2	11	.2	2	.1
1	6	.1	0	.0
0	0	.0	1	.0
Total	4670	100.0	2994	100.0
$\overline{X}$	12.30		15.42	
σ	3.67		3.98	

85/100 of the grade 1 standard deviation. This is a substantial difference, quite large enough to be meaningful. Furthermore, since Cohort B (the grade 3 group) does not include any of the children who did well enough to be exited from services before reaching grade 3, if Cohort A were "purified" by eliminating such cases so that the Cohort A and Cohort B cases were more nearly equivalent the difference between the two distributions would be larger.

D4

4. INTERCORRELATIONS AMONG PARTS AND TOTAL

The Coloured Progressive Matrices (CPM), given to Cohort A (grade 1), consists of three 12-item scales--Scales A, AB, and B--in ascending order of difficulty. The Standard Progressive Matrices (SPM), given to Cohort B (grade 3) consists of five 12-item scales--Scales A, B, C, D, and E--also in ascending order of difficulty. Scales A and B provide the 24 items that are common to the two levels of the Raven (see section 3 above). Table D.2a shows the intercorrelations among parts and total for LM-LEP students in Cohort A; Table D.2b shows the corresponding data for Cohort B[1]. The correlation of scales A+B with the rest of the test is .66 for Cohort A LM-LEP students and .67 for Cohort B.

D5

5. RELIABILITY ESTIMATES

The correlation of scales A+B with the rest of the test can be used as the basis in estimating the Raven's reliability for LM-LEP students. If these correlations are considered to be the correlations between unequal "halves" with unequal standard deviations, Angoff's formula No. 16 (Angoff, 1953) can be applied to provide an estimate of the reliability of the total test. This estimate, at least in the case of the SPM (given to Cohort B), should be regarded as a lower-bound estimate of test reliability, in view of the marked difference in difficulty between the parts, which is deliberate and systematic. The two reliability estimates are .80 (for CPM, Cohort A) and .81 (for SPM, Cohort B).

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[1] The tables also show the correlations of these variables with number of items omitted.

APPENDIX E

TECHNICAL APPENDIX ON STANFORD ACHIEVEMENT TEST

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Appendix E: TECHNICAL APPENDIX ON STANFORD ACHIEVEMENT TEST

As discussed in Chapter 2, selected tests from appropriate levels of the Stanford Achievement Test are being given each year to all students in the study (and twice in the first year, to students in Cohort B).

E1 1. SCORE DISTRIBUTIONS AND RELATED DATA

Table E.1 shows the distributions of adjusted scores for Cohort A (grade 1) in the spring of 1985 for all three basic groups (LM-LEP, EP/LIS, and EP/Comp). Table E.2 shows similar data for Cohort B (grade 3). Table E.3 shows the test publishers's percentiles (based on a national sample for the grade, not a LM-LEP sample) corresponding to the mean rights score, and to points one standard deviation above and one standard deviation below the mean. These data are provided not only for LM-LEP students but also for the other two groups, EP/LIS and EP/Comp.

E2 2. CORRELATIONAL DATA (Correlations of SAT with Other Variables)

Tables E.4a (for Cohort A, 28 variables) and E.4b (for Cohort B, 37 variables) are correlation tables based on LM-LEP students. These tables contain the Raven total, all SAT scores (adjusted), all English SOPR scores, teacher ratings on selected academic skills variables (five in English and three in math) and the following three composites related to the students' homes and families:

1. Parents' use of English in the home
2. Parents' education
3. Socioeconomic status

TABLE E.1. Distribution of adjusted scores on Stanford Achievement Test: Spring 1985
Cohort A, Grade 1 - Primary 1 battery, Form F

SCORE	NO. OF CASES					
	Reading			Math Total		
* →	A	B	C	A	B	C
79				-	-	-
78				-	1	-
77				5	1	1
76				3	9	-
75				21	8	2
74				10	9	2
73				21	10	1
72				33	15	6
71				44	16	6
70				57	15	3
69				53	19	6
68				54	21	13
67				36	17	6
66				71	15	8
65				69	20	16
64				87	14	11
63				85	14	10
62				93	13	14
61				76	17	8
60				64	15	10
59				76	22	5
58				70	15	7
57				99	14	8
56				79	12	16
55				86	14	11
54				91	6	12
53				64	25	14
52				79	14	7
51				76	18	6
50				95	14	10
49				84	11	5
48				85	13	10
47				100	15	9
46				103	12	7
45				98	13	11
44				84	13	5
43				88	11	11
42				84	12	9
41				71	14	11
40	43	46	25	89	9	6
39	60	29	27	65	6	6

SCORE	N U M B E R O F C A S E S																					
	English						Math											
	Vocabulary			Reading			Concepts			Computation			Applications			Total		
* →	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
38	1	1	-	60	33	27										73	11	7
37	5	1	3	68	23	22										60	10	7
36	7	6	2	70	25	19										67	11	9
35	9	8	5	78	17	15										70	8	7
34	6	8	5	56	17	12	6	5	-							57	8	6
33	14	13	6	58	20	12	36	20	2							54	8	3
32	19	16	11	64	16	12	68	17	10							45	4	5
31	27	16	11	69	14	17	92	34	8							60	11	5
30	24	21	7	58	14	7	116	35	16							49	2	5
29	39	28	16	62	21	18	128	34	14							56	9	6
28	53	30	10	61	12	3	134	38	26							36	4	1
27	55	37	23	77	20	8	146	46	22							36	5	2
26	68	32	25	65	11	18	164	41	22							24	6	4
25	88	37	26	85	20	6	168	38	29							35	-	3
24	79	36	24	94	21	10	180	39	23							23	3	1
23	121	39	20	80	24	9	187	33	25				8	4	5	17	2	-
22	145	40	26	96	20	10	210	40	24	190	44	21	43	26	8	23	2	3
21	168	36	24	112	24	15	211	43	19	229	68	23	110	48	15	13	5	-
20	155	40	20	149	30	7	233	34	19	284	53	27	135	40	26	11	-	-
19	191	37	21	128	27	14	219	36	25	310	60	23	229	71	27	10	-	-
18	209	30	22	124	27	15	232	29	20	311	48	25	250	46	33	12	-	1
17	224	31	15	146	28	14	203	32	16	255	50	30	274	72	32	4	1	-
16	190	34	9	155	34	13	189	27	18	259	37	20	274	53	40	1	1	-
15	186	28	15	166	24	15	187	24	24	281	45	32	265	44	29	-	-	-
14	169	15	9	162	18	14	165	17	6	239	33	28	302	53	33	3	-	-
13	158	19	13	133	15	8	162	13	13	212	38	19	258	46	32	3	-	-
12	152	18	3	104	11	5	107	9	7	187	26	15	260	38	28	1	-	-
11	78	6	6	58	5	4	89	13	7	201	28	24	240	31	19	-	-	-
10	56	4	3	30	5	2	62	8	2	164	28	26	227	28	23	-	-	-
9	41	3	8	14	-	1	52	5	3	162	18	20	215	22	12	-	-	-
8	17	2	1	11	-	-	30	4	1	163	26	14	172	19	14	-	-	-
7	15	-	-	1	1	-	11	-	-	129	26	15	133	8	4	-	-	-
6	6	-	-	-	-	-	8	-	1	122	22	15	134	9	2	-	-	-
5	1	-	-	-	-	-	1	1	-	72	16	7	61	6	4	-	-	-
4	-	-	-	-	-	-	1	-	-	61	14	3	25	2	2	-	-	-
3	-	-	-	-	-	-	2	-	-	42	10	4	8	1	1	-	-	-
2	-	-	-	-	-	-	-	-	-	9	1	2	4	-	1	-	-	-
1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	2776	672	389	2797	652	404	3799	715	402	3883	391	393	3627	667	390	3491	643	384

*CODE FOR CATEGORIES OF STUDENTS
A - LM-LEP
B - EP/LIS
C - EP/Comp

TABLE E.2. Distribution of adjusted scores on Stanford Achievement Test: Spring 1985
Cohort B, Grade 3 - Primary 3 battery, Form F

SCORE *→	NUMBER OF CASES Math Total A	B	C
114	-	-	-
113	-	-	-
112	3	1	-
111	2	2	-
110	3	2	2
109	7	3	1
108	7	-	-
107	4	2	2
106	8	1	4
105	6	4	2
104	8	4	4
103	10	6	6
102	18	6	2
101	14	11	2
100	14	11	5
99	13	9	3
98	11	5	3
97	27	9	5
96	19	17	1
95	24	5	7
94	20	9	1
93	21	12	11
92	33	7	2
91	19	8	8
90	27	15	7
89	30	8	5
88	38	10	5
87	48	14	5
86	41	8	10
85	30	12	5
84	34	11	9
83	49	9	4
82	36	22	7
81	33	13	8
80	44	8	8

SCORE *→	NO. OF CASES English Reading A	B	C	Math Comput. A	B	C	Math Total A	B	C
79							40	5	12
78							35	18	8
77							42	15	7
76							49	12	3
75							47	12	4
74							52	14	3
73							52	15	9
72							53	12	5
71							41	9	8
70							43	8	6
69							46	15	13
68							52	10	4
67							42	10	9
66							44	7	9
65							45	14	5
64							49	11	8
63							44	6	4
62							55	7	8
61							60	10	6
60	-	2	-				56	9	5
59	1	2	2				38	7	2
58	-	4	6				39	15	2
57	8	9	4				40	4	6
56	5	15	4				50	9	2
55	10	13	9				34	6	5
54	16	14	9				37	8	5
53	13	14	7				41	8	7
52	16	10	17				40	7	4
51	17	19	7				42	9	4
50	14	17	10				50	10	4
49	25	20	4				42	5	5
48	22	28	11				42	10	7
47	26	17	12				41	9	4
46	30	16	13				42	4	1
45	38	15	14				37	2	6
44	31	19	16				42	10	5
43	32	25	9				42	6	5
42	42	11	7	31	8	4	38	4	2
41	43	14	15	67	15	10	28	3	2
40	32	24	19	108	21	13	29	5	2
39	46	17	17	112	33	24	36	6	3

SCORE *→	NUMBER OF CASES English Vocab. A	B	C	English Reading A	B	C	Math Concepts A	B	C	Math Comput. A	B	C	Math Applic. A	B	C	Math Total A	B	C
38	-	-	1	52	27	10				129	27	18	6	-	3	27	4	5
37	1	1	1	58	26	15				156	28	12	11	8	1	25	3	2
36	2	2	2	63	22	13				157	30	16	18	11	6	30	4	1
35	7	3	3	70	14	9				136	33	20	20	27	8	18	1	3
34	2	5	3	67	15	4	8	3	-	133	31	19	40	22	14	20	1	-
33	2	10	3	82	11	7	13	7	4	119	33	13	38	18	17	23	6	1
32	5	12	6	77	23	9	24	11	6	134	32	15	45	27	10	28	3	1
31	7	13	10	79	11	8	45	14	11	127	45	14	48	26	17	23	2	2
30	7	14	10	101	11	4	45	21	6	121	22	16	71	23	14	14	3	4
29	14	15	13	96	22	10	57	38	13	114	26	22	59	22	16	12	1	3
28	19	17	8	91	17	10	83	31	17	104	29	6	76	24	11	17	-	1
27	20	17	9	77	19	11	93	39	15	119	24	12	65	24	20	8	-	3
26	21	24	13	108	13	7	115	38	27	118	19	16	78	18	13	9	1	1
25	27	33	18	92	11	6	120	44	35	120	22	17	85	25	16	9	-	-
24	39	24	17	93	8	8	129	41	24	84	24	12	88	36	13	11	3	2
23	37	33	16	112	15	10	156	45	21	105	23	13	79	27	10	2	-	1
22	58	31	23	114	11	4	152	39	24	105	11	10	91	31	17	2	2	-
21	74	27	22	101	16	9	162	37	23	97	12	9	113	27	13	3	1	-
20	58	33	16	125	12	5	173	41	24	80	14	6	116	24	22	2	-	-
19	95	44	23	134	7	5	164	39	22	69	15	16	122	33	11	2	-	1
18	124	37	29	120	9	10	197	29	25	94	10	8	118	24	12	2	-	-
17	130	42	32	110	18	9	189	31	21	81	20	9	120	25	14	-	-	-
16	159	45	33	104	17	6	197	34	20	78	16	8	155	26	14	-	-	-
15	175	45	18	88	8	3	172	33	20	76	16	8	152	32	15	-	-	-
14	229	44	18	71	11	3	162	18	8	74	17	8	149	25	14	-	-	-
13	256	35	14	58	7	2	168	20	12	55	16	9	130	21	14	1	-	-
12	243	29	20	30	2	-	133	13	8	53	8	9	164	16	10	-	-	-
11	254	21	6	22	3	1	150	11	5	47	10	6	136	18	13	-	-	-
10	227	14	10	10	-	-	105	14	8	40	7	3	109	14	15	-	-	-
9	196	17	5	6	1	-	86	7	8	27	5	9	123	12	18	-	-	-
8	153	10	3	2	-	-	70	6	4	28	4	2	109	11	9	-	-	-
7	84	5	6	-	-	-	44	5	4	19	2	1	67	8	6	-	-	-
6	47	1	-	-	-	-	14	1	2	10	-	3	56	4	3	-	-	-
5	29	1	-	-	-	-	11	-	1	6	-	1	22	2	3	-	-	-
4	14	-	-	-	-	-	7	-	1	-	2	-	6	4	-	-	-	-
3	1	-	-	-	-	-	4	-	-	-	-	-	4	1	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	2816	704	411	2880	712	410	3248	710	419	3333	710	417	2889	676	412	2766	665	396

*CODE FOR CATEGORIES OF STUDENTS
A = LM-LEP
B = EP/LIS
C = EP/Comp

TABLE E.3. SAT percentiles corresponding to mean RIGHTS score(R) and to 1 S.D. above and below mean*

Cohort	Grade	Data Collection Period	SAT Battery	Form	Group		ENGLISH				MATHEMATICS									
							Vocab.		Reading Comp.		Concepts of No.		Comput.		Applic.		Comput. + Applic.		Math Total	
							$\bar{R}$	%ile	$\bar{R}$	%ile	$\bar{R}$	%ile	$\bar{R}$	%ile	$\bar{R}$	%ile	$\bar{R}$	%ile	$\bar{R}$	%ile
A	1	Spring'85	Primary 1	F	LM-LEP	$\bar{X} + \sigma$	24.3	50	30.8	50	26.5	54		--		--	36.2	60	61.9	58
						$\bar{X}$	18.2	22	20.8	25	20.0	22		--		--	27.5	28	47.8	27
						$\bar{X} - \sigma$	12.1	4	10.8	3	13.5	5		--		--	18.8	9	33.7	8
					EP/LIS	$\bar{X} + \sigma$	28.6	71	35.1	62	28.8	68		--		--	38.9	74	67.2	72
						$\bar{X}$	22.2	39	25.0	35	22.4	34		--		--	29.9	35	52.7	35
						$\bar{X} - \sigma$	15.8	13	14.9	10	16.0	10		--		--	20.9	13	38.2	13
					EP/Comp	$\bar{X} + \sigma$	28.6	71	36.8	71	27.5	60		--		--	37.2	64	63.9	63
						$\bar{X}$	22.2	39	26.5	40	21.5	28		--		--	28.6	31	50.4	31
						$\bar{X} - \sigma$	15.8	13	16.2	13	15.5	9		--		--	20.0	11	36.9	12
B	3	Fall'84	Primary 2	E	LM-LEP	$\bar{X} + \sigma$	19.8	22	29.5	32	26.6	58	34.5	83	26.7	57		--	84.8	61
						$\bar{X}$	14.9	7	20.6	15	20.4	28	26.7	44	20.4	25		--	67.9	30
						$\bar{X} - \sigma$	10.0	1	11.7	4	14.2	8	18.9	16	14.1	6		--	51.0	10
					EP/LIS	$\bar{X} + \sigma$	27.4	64	37.3	80	29.8	77	35.9	90	30.5	79		--	93.6	80
						$\bar{X}$	21.3	30	28.4	29	23.9	43	28.3	50	24.4	44		--	77.0	45
						$\bar{X} - \sigma$	15.2	7	19.5	14	18.0	19	20.7	21	18.3	17		--	60.4	19
					EP/Comp	$\bar{X} + \sigma$	27.6	66	36.4	73	29.2	73	34.9	85	29.6	74		--	91.5	75
						$\bar{X}$	21.9	32	27.9	28	23.1	39	26.6	43	23.1	38		--	72.9	38
						$\bar{X} - \sigma$	16.2	10	19.4	13	17.0	16	18.3	15	16.6	12		--	54.3	13
B	3	Spring'85	Primary 3	F	LM-LEP	$\bar{X} + \sigma$	19.3	34	37.4	44	24.7	62	36.2	74	25.8	56		--	84.3	65
						$\bar{X}$	13.9	14	26.3	21	18.3	32	26.8	37	17.9	29		--	63.9	35
						$\bar{X} - \sigma$	8.5	2	15.2	6	11.9	12	17.4	14	10.0	8		--	43.5	12
					EP/LIS	$\bar{X} + \sigma$	25.8	63	48.4	72	27.5	76	36.8	77	30.3	74		--	91.9	78
						$\bar{X}$	19.3	34	35.3	39	21.4	47	27.5	40	22.0	42		--	71.6	45
						$\bar{X} - \sigma$	12.8	11	22.2	14	15.3	22	18.2	15	13.7	16		--	51.3	19
					EP/Comp	$\bar{X} + \sigma$	26.4	66	49.8	76	26.8	73	36.7	76	29.8	72		--	90.5	75
						$\bar{X}$	19.8	36	37.4	44	20.7	44	26.9	38	21.2	40		--	69.6	42
						$\bar{X} - \sigma$	13.2	12	25.0	18	14.6	20	17.1	13	12.6	13		--	48.7	17

*Numbers of cases on which the means are based are shown on Tables 8.2a and 8.2b.

E3

3. COMPARING ADJUSTED SCORES AND RIGHTS SCORES

The results when adjusted scores are correlated with rights scores on the SAT tests are somewhat similar to the corresponding results for the Raven (which are discussed in Appendix D, Section D.2). The correlations are very high, as shown in Table E.5, though not generally as high as the comparable ones for the Raven. One reason they are lower is probably that the SAT items have fewer options than the Raven items, and therefore in calculating adjusted scores a given number of omitted items results in a larger score adjustment.

We indicated in Appendix D that there was justification for using adjusted scores for the Raven. The same arguments apply to the SAT, but to an even greater extent, since some of the SAT correlations between rights and adjusted scores are substantially lower.

E4

4. TEST RELIABILITY

The published KR-20 and parallel-forms reliability coefficients based on national samples are reproduced in Table E.6a (column 6) and Table E.6b (column 6). Column 7 of Table E.6b contains an improved parallel-forms estimate, correcting for the fact that the two forms have unequal standard deviations (Angoff, 1953, Formula 6). All these reliability coefficients are for Rights scores, of course, since those are the scores that were used in the standardization and in the equating of forms.

TABLE E.4a. Correlations among Stanford Achievement Test scores and other variables: Cohort A, LM-LEPs, Grade 1

Row #		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17
		Stanford Achievement Test - Primary 1 - Spr.'85									English SOPR						
		ENGLISH			MATH					Total							
		Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math	Total	Comprehension	Speaking	Fluency	Vocabulary	Pronunciation	Grammar
		← CORRELATION COEFFICIENTS →															
1	Raven CPM	.242	.351	.350	.438	.359	.430	.443	.469	.455	.134	.145	.128	.126	.124	.118	.122
	SAT-Primary 1 -- Spring '85																
	English																
2	Vocabulary		.524	.815	.486	.317	.513	.461	.502	.723	.267	.236	.269	.277	.258	.227	.265
3	Rdg.Comprehension			.921	.586	.423	.540	.540	.595	.833	.255	.255	.249	.266	.238	.209	.237
4	English Total				.622	.434	.603	.578	.635	.898	.296	.282	.292	.308	.280	.246	.283
	Math																
5	Concepts of No.					.618	.736	.760	.916	.855	.209	.204	.205	.216	.191	.176	.201
6	Computation						.565	.902	.833	.707	.154	.171	.147	.153	.142	.125	.141
7	Applications							.866	.864	.815	.274	.265	.270	.272	.262	.236	.260
8	Comput.+Applic.								.957	.855	.237	.243	.230	.235	.223	.199	.222
9	Math Total									.910	.240	.241	.234	.241	.223	.202	.227
	English + Math																
10	Total										.295	.288	.290	.302	.277	.247	.281
	English SOPR																
11	Total											.927	.996	.951	.961	.936	.954
12	Comprehension												.888	.874	.860	.814	.841
13	Speaking -- total													.949	.964	.945	.961
14	Fluency														.909	.843	.872
15	Vocabulary															.873	.901
16	Pronunciation																.896
17	Grammar																
	End-of-year ratings by teachers, on Student Evaluation Form																
	English skills																
18	Pronunciation																
19	Oral communication																
20	Vocabulary																
21	Mechanics of reading																
22	Reading comprehension																
	Math																
23	Concept of Nos.																
24	Computation (accuracy)																
25	Word problems																
26	Parents' use of English																
27	Parents' education(Composite B)																
28	Socioeconomic status																

*The 25 variables for which N=1550 constitute a "listwise" set. For the remaining 3 variables, all cases were within the 25-variable listwise set, but the 3 variables were handled on a pairwise basis.

TABLE E.4a. (Continued)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)					
End-of-year ratings by teachers								Characteristics of home and parents							
English Skills					Math										
Pronunciation	Oral Communication	Vocabulary	Mech. of Reading	Reading Comprehension	Concept of Nos.	Computation (accuracy)	Word Problems	Parents' Use of English	Parents' Education	SES	Mean	S.D.	N*	Possible range	Row #
.202	.194	.253	.276	.272	.307	.311	.301	.004	.119	.174	18.719	5.719	1550	0-36	1
.323	.326	.368	.399	.414	.242	.237	.271	.158	.191	.215	19.064	5.605	1550	0-38	2
.360	.356	.435	.550	.541	.349	.349	.385	.091	.126	.150	23.882	8.349	1550	0-40	3
.393	.392	.464	.557	.558	.348	.346	.386	.134	.172	.200	42.946	12.255	1550	0-78	4
.300	.301	.369	.432	.427	.436	.443	.428	-.008	.080	.082	21.236	5.805	1550	0-34	5
.163	.190	.224	.300	.299	.424	.440	.404	-.068	.037	.068	14.845	4.872	1550	0-22	6
.281	.281	.329	.382	.387	.382	.387	.392	.046	.113	.142	13.897	4.215	1550	0-23	7
.246	.263	.308.	.382	.384	.457	.469	.450	-.017	.082	.115	28.743	8.045	1550	0-45	8
.286	.296	.355	.429	.428	.477	.488	.469	-.014	.086	.107	49.978	13.015	1550	0-79	9
.374	.379	.451	.543	.543	.458	.463	.474	.064	.142	.170	92.924	22.850	1550	0-157	10
.405	.433	.421	.362	.377	.202	.197	.240	.304	.195	.254	16.506	5.696	1550	5-25	11
.343	.381	.376	.339	.355	.197	.191	.218	.257	.169	.238	3.490	1.174	1550	1-5	12
.412	.437	.423	.359	.374	.199	.194	.240	.308	.197	.252	13.016	4.628	1550	4-20	13
.398	.431	.412	.354	.364	.196	.190	.230	.302	.188	.244	3.159	1.215	1550	1-5	14
.391	.422	.410	.348	.361	.188	.180	.232	.310	.204	.262	3.236	1.216	1550	1-5	15
.387	.392	.379	.319	.333	.179	.183	.223	.282	.174	.215	3.390	1.201	1550	1-5	16
.397	.423	.414	.351	.371	.196	.189	.233	.282	.186	.243	3.231	1.214	1550	1-5	17
	.886	.855	.741	.746	.506	.501	.571	.207	.164	.167	2.564	.961	1550	1-5	18
		.880	.754	.766	.516	.507	.590	.217	.176	.201	2.537	.976	1550	1-5	19
			.804	.810	.523	.522	.613	.220	.154	.184	2.437	.984	1550	1-5	20
				.916	.578	.583	.643	.172	.152	.176	2.546	1.049	1550	1-5	21
					.562	.566	.634	.168	.144	.190	2.465	1.054	1550	1-5	22
						.942	.799	.032	.062	.059	3.128	.919	1550	1-5	23
							.829	.020	.047	.052	3.080	.931	1550	1-5	24
								.054	.077	.086	2.766	1.030	1550	1-5	25
									.340	.392	.843	1.060	1347	0-4	26
										.851	7.858	3.904	1332	0-14	27
											14.931	5.224	741	3-29	28

TABLE E.4b. Correlations among Stanford Achievement Test scores and other variables -- Cohort B, LM-LEPs, Grade 3

Row #		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
		Stanford Achievement Test - Primary 2 - Fall'84									Stanford Achievement Test - Primary 3 - Spr.'85								
		ENGLISH			MATH					Total	ENGLISH			MATH					Total
		Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math	Vocabulary	Reading	Total	Concepts of No.	Comput.	Applic.	Comp.+ Applic.	Total	English + Math
		CORRELATION COEFFICIENTS																	
1	Raven SPM	.202	.346	.338	.452	.350	.386	.422	.462	.463	.186	.337	.322	.482	.352	.432	.435	.479	.461
	SAT-Primary 2 - Fall'84																		
	English																		
2	Vocabulary		.461	.766	.380	.170	.463	.354	.387	.613	.561	.471	.566	.325	.151	.338	.266	.302	.460
3	Rdg.Comp.			.924	.523	.350	.516	.493	.536	.786	.440	.727	.708	.495	.372	.559	.513	.544	.682
4	English Total				.543	.327	.574	.510	.556	.834	.561	.730	.758	.499	.335	.551	.487	.523	.693
	Math																		
5	Concepts of No.					.572	.709	.732	.880	.836	.357	.495	.505	.677	.500	.574	.598	.662	.666
6	Computation						.507	.886	.830	.703	.138	.351	.314	.537	.628	.493	.632	.643	.564
7	Applications							.849	.854	.834	.450	.508	.550	.595	.433	.582	.562	.609	.652
8	Comput.+Applic.								.968	.880	.327	.489	.488	.649	.618	.615	.690	.722	.697
9	Math Total									.922	.360	.524	.527	.703	.616	.641	.702	.748	.732
	English + Math																		
10	Total										.500	.687	.702	.698	.564	.682	.692	.740	.808
	SAT-Primary 3 - Spr.'85																		
	English																		
11	Vocabulary											.527	.776	.390	.178	.407	.318	.361	.598
12	Rdg.Comp.												.945	.536	.434	.642	.593	.614	.840
13	English Total													.548	.390	.633	.563	.595	.853
	Math																		
14	Concepts of No.														.597	.689	.715	.853	.809
15	Computation															.597	.909	.889	.746
16	Applications																.877	.875	.863
17	Comput.+Applic.																	.975	.895
18	Math Total																		.927
	English + Math																		
19	Total																		
	English SOPR																		
20	Total																		
21	Comprehension																		
22	Speaking - Total																		
23	Fluency																		
24	Vocabulary																		
25	Pronunciation																		
26	Grammar																		
	End-of-yr.ratings by teachers on Student Evaluation Form																		
	English skills																		
27	Pronunciation																		
28	Oral communic.																		
29	Vocabulary																		
30	Mech.of Reading																		
31	Rdg.Comp.																		
	Math																		
32	Concept of Nos.																		
33	Comput.(accur.)																		
34	Word problems																		
35	Parents' use of Eng.																		
36	Parents' education (Composite B)																		
37	Socioeconomic status																		

*The 34 variables for which N=1434 constitute a "listwise" set. For the remaining 3 variables, all cases were within the 34-variable listwise set, but the 3 variables were handled on a pairwise basis.

TABLE E.4b. (Continued)

English SOPR							End-of-year ratings by teachers								Characteristics of home and parents							
							English Skills					Math										
(20) Total	(21) Comprehension	(22) Speaking	(23) Fluency	(24) Vocabulary	(25) Pronunciation	(26) Grammar	(27) Pronunciation	(28) Oral Communication	(29) Vocabulary	(30) Mech. of Reading	(31) Reading Comprehension	(32) Concept of Nos.	(33) Computation (accuracy)	(34) Word Problems	(35) Parents' Use of English	(36) Parents' Education	(37) SES	Mean	S.D.	N*	Possible range	Row #
.138	.123	.137	.139	.118	.127	.132	.166	.153	.177	.252	.237	.303	.310	.297	-.052	.007	.028	26.310	9.210	1434	0-60	1
.396	.329	.400	.384	.386	.359	.372	.388	.386	.398	.381	.397	.205	.217	.272	.260	.239	.271	15.597	4.875	1434	0-35	2
.471	.419	.469	.451	.450	.414	.446	.411	.440	.461	.543	.547	.320	.318	.381	.114	.165	.201	22.954	8.200	1434	0-40	3
.512	.446	.512	.492	.493	.455	.484	.465	.485	.506	.558	.568	.320	.324	.393	.195	.223	.262	38.551	11.308	1434	0-75	4
.312	.282	.309	.296	.289	.279	.289	.297	.310	.312	.380	.401	.392	.409	.383	.002	.067	.081	21.453	5.921	1434	0-34	5
.176	.175	.170	.155	.161	.154	.168	.176	.198	.226	.312	.321	.418	.441	.390	-.095	-.007	-.004	28.210	6.904	1434	0-38	6
.388	.345	.386	.363	.365	.361	.362	.332	.344	.349	.394	.400	.360	.378	.387	.070	.114	.119	21.135	6.064	1434	0-36	7
.317	.293	.312	.290	.295	.289	.298	.287	.307	.327	.404	.412	.450	.474	.447	-.021	.058	.063	49.344	11.264	1434	0-74	8
.336	.308	.332	.312	.313	.305	.318	.310	.329	.343	.422	.435	.458	.482	.453	-.014	.065	.073	70.797	16.112	1434	0-108	9
.461	.412	.459	.436	.437	.414	.436	.422	.444	.463	.540	.553	.453	.470	.484	.082	.148	.174	109.348	24.289	1434	0-183	10
.376	.327	.376	.370	.354	.324	.365	.343	.367	.368	.361	.380	.213	.210	.239	.231	.198	.208	14.310	5.444	1434	0-38	11
.431	.373	.432	.420	.410	.380	.414	.434	.452	.460	.555	.570	.364	.368	.432	.140	.138	.184	28.540	10.472	1434	0-60	12
.465	.402	.466	.454	.441	.407	.448	.454	.476	.498	.551	.569	.352	.354	.412	.194	.179	.216	42.850	14.121	1434	0-98	13
.261	.230	.261	.259	.231	.238	.252	.285	.299	.310	.405	.400	.430	.452	.426	.016	.070	.100	19.363	6.237	1434	0-34	14
.142	.127	.141	.135	.131	.120	.146	.193	.214	.250	.330	.326	.469	.478	.423	-.049	-.019	-.028	28.530	8.759	1434	0-42	15
.257	.230	.256	.246	.230	.237	.248	.337	.360	.389	.468	.480	.471	.461	.474	.006	.083	.086	19.045	7.618	1434	0-38	16
.219	.195	.218	.209	.198	.195	.216	.290	.316	.352	.441	.445	.526	.526	.500	-.026	.032	.029	47.575	14.643	1434	0-80	17
.247	.219	.246	.238	.222	.221	.242	.308	.331	.362	.459	.460	.530	.537	.509	-.014	.046	.054	66.958	19.596	1434	0-114	18
.377	.330	.377	.367	.350	.334	.366	.412	.437	.467	.555	.564	.508	.514	.523	.082	.115	.138	109.808	30.209	1434	0-212	19
	.897	.993	.940	.938	.919	.934	.459	.456	.444	.431	.424	.195	.191	.278	.226	.216	.275	17.974	4.513	1434	5-25	20
		.839	.812	.791	.761	.787	.389	.396	.392	.393	.391	.187	.191	.256	.176	.165	.216	3.809	.978	1434	1-5	21
			.942	.945	.930	.941	.461	.456	.442	.426	.418	.190	.185	.275	.232	.223	.281	14.165	3.661	1434	4-20	22
				.866	.829	.842	.447	.444	.427	.412	.404	.194	.195	.278	.229	.216	.270	3.482	.990	1434	1-5	23
					.827	.859	.435	.442	.429	.410	.398	.185	.174	.262	.224	.205	.258	3.531	.982	1434	1-5	24
						.838	.422	.401	.380	.375	.363	.152	.148	.230	.189	.200	.265	3.656	.980	1434	1-5	25
							.430	.426	.426	.405	.406	.182	.178	.262	.228	.216	.266	3.496	.943	1434	1-5	26
								.885	.857	.758	.739	.436	.422	.515	.209	.238	.256	2.501	.394	1434	1-5	27
									.884	.784	.776	.483	.468	.553	.213	.262	.286	2.478	.934	1434	1-5	28
										.803	.816	.513	.495	.582	.203	.258	.290	2.393	.930	1434	1-5	29
											.895	.550	.547	.628	.127	.187	.208	2.522	.958	1434	1-5	30
												.577	.567	.668	.124	.202	.223	2.440	.976	1434	1-5	31
													.912	.816	-.058	.053	.047	3.064	.915	1434	1-5	32
														.827	-.038	.052	.072	3.026	.968	1434	1-5	33
															.017	.107	.130	2.653	1.033	1434	1-5	34
																.383	.418	.700	1.015	1264	0-4	35
																	.862	7.412	3.568	1257	0-14	36
																		14.129	5.250	711	3-29	37

TABLE E.5. Correlations between rights scores and adjusted scores on Stanford Achievement Test variables

Stanford Achievement Test	SAT Primary 1 Spring '85 Cohort A Grade 1		SAT Primary 2 Fall '84 Cohort B Grade 3		SAT Primary 3 Spring '85 Cohort B Grade 3	
	r	N	r	N	r	N
English						
Vocabulary	.972	3837	.986	3746	.992	3931
Reading Comprehension	.966	3853	.989	3835	.980	4002
Math						
Concepts of Number	.989	4916	.995	4118	.995	4377
Computation	.988	4967	.993	4204	.993	4460
Applications	.990	4684	.996	4118	.994	3997
Comput. + Applic.	.992	4642				
Total	.994	4518	.997	4001	.996	3827

We have applied the correction-for-range formula to get an approximation of the corresponding reliability for our LM-LEP sample. The formula is:

$$r_{BB} = 1 - \frac{s_A^2}{s_B^2}(1 - r_{AA})$$

where r_{BB} is the reliability of Form B and r_{AA} is the reliability of Form A. It should be understood that in this situation the corrected values are only approximations. Normally the correction-for-range formula gives very accurate estimates, but it is normally applied when the population for one of the two groups is just a narrower segment of the population corresponding to the other group. Either the original population for which the source reliability coefficient exists or the new population for which a reliability coefficient is to be estimated by the correction-for-range formula may be the narrower segment, since the formula works in either direction. But when the new population is of an entirely different character from the original one, e.g., LM-LEP rather than mostly native English-speaking, it is not at all clear how well the correction formula works. Therefore the reader is urged to regard the reliability estimates for the LM-LEP population, which are shown in column 11 of Table E.6a and E.6b, with considerable caution.

The corrected reliabilities discussed above (i.e., the estimates for the LM-LEP sample) are for Rights scores, since that is what the original reliabilities are for. It seems likely, however, in view of the fact that the correlations between rights and adjusted scores are so high, that the reliabilities of the adjusted scores will be very close to those of the corresponding rights scores--possibly higher, certainly not much lower.

TABLE E.6a. Correcting KR-20 reliability of SAT Rights scores (R scores) for range

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
SAT level and form	Test	No. of items (n)	Data based on test publisher's national standardization sample*					Data based on LM-LEP students in present study				LM-LEP r_{RR} (obtained by correcting for range)
			Grade	N	$\bar{R}$	σ_R	r_{RR}**	Grade	N	$\bar{R}$	σ_R	
Primary 1 Form F	Vocabulary	38	1.8	4608	24.6	6.4	.83	1.8	3837	19.31	6.42	.831
	Reading Comp.	40	1.8	4680	27.8	9.9	.94	1.8	3853	22.08	10.26	***
	Concepts of No.	34	1.8	4674	23.9	5.7	.84	1.8	4916	20.49	6.49	.877
	Comput + Applic.	45	1.8	4668	31.0	8.4	.90	1.8	4642	27.84	8.81	.909
	Math Total	79	1.8	4628	54.9	13.3	.93	1.8	4518	48.73	14.23	.939
Primary 2 Form E	Vocabulary	35	3.1	5890	24.8	5.8	.83	3.3	3746	16.72	5.93	.837
	Reading Comp.	40	3.1	5906	30.7	8.0	.92	3.3	3835	22.65	9.48	***
	Concepts of No.	34	3.1	5908	24.5	6.2	.86	3.3	4118	21.20	6.29	.864
	Computation	38	3.1	5911	27.0	7.4	.90	3.3	4204	26.92	7.82	.910
	Math Applic.	36	3.1	5893	25.2	6.2	.84	3.3	4118	21.30	6.46	.853
	Math Total	108	3.1	5853	76.8	17.7	.95	3.3	4001	69.88	17.33	.948
Primary 3 Form F	Vocabulary	38	3.8	2729	23.1	7.0	.86	3.8	3931	15.48	6.28	.826
	Reading Comp.	60	3.8	2751	39.1	13.1	.95	3.8	4002	28.90	12.34	***
	Concepts of No.	34	3.8	2732	22.1	6.5	.87	3.8	4377	19.01	6.44	.868
	Computation	42	3.8	2745	27.6	9.2	.92	3.8	4460	26.95	9.46	.924
	Math Applic.	38	3.8	2742	24.2	8.5	.92	3.8	3997	18.97	8.24	.915
	Math Total	114	3.8	2715	74.1	21.7	.96	3.8	3827	65.86	20.66	.956

*The data in columns 2-6 are from the Stanford Achievement Test Technical Data Report (Gardner et al., 1985).

**KR-20 reliability.

***Not obtained, because for a test of this sort KR-20 tends to give a spuriously high reliability coefficient.

TABLE E.6b. Correcting parallel forms reliability of SAT Rights scores (R scores) for range

SAT Level	Test	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		No. of items	Data based on test publisher's equating-of-forms sample*						Data based on LM-LEP students in present study			LM-LEP r_{RR} (obtained by correcting col. 7 r_{RR} for range)
			Form E		Form F							
		(n)	$\bar{R}$	σ_R	$\bar{R}$	σ_R	r_{EF}**	r_{RR}***	N	$\bar{R}$	σ_R	
Primary 1			Grade 2.1					Form F ↓	Form F Grade 1, Spring			Form F
	Vocabulary	38	27.8	5.9	26.8	5.5	.77	.763	3837	19.31	6.42	.826
	Reading Comp.	40	32.3	8.0	32.8	8.5	.86	.864	3853	22.08	10.26	.907
	Concepts of No.	34	26.2	5.3	25.7	5.4	.77	.772	4916	20.49	6.49	.842
	Comput + Applic.	45	33.1	7.2	32.6	7.7	.84	.845	4642	27.84	8.81	.882
	Math Total	79	59.3	11.8	58.3	12.2	.88	.882	4518	48.73	14.23	.913
Primary 2			Grade 3.1					Form E ↓	Form E Grade 3, Fall			Form E
	Vocabulary	35	23.8	5.9	23.7	5.9	.81	.810	3746	16.72	5.93	.812
	Reading Comp.	40	30.1	7.9	30.6	7.7	.77	.773	3835	22.65	9.48	.842
	Concepts of No.	34	24.3	6.0	24.4	6.1	.86	.859	4118	21.20	6.29	.872
	Computation	38	27.0	7.4	27.2	7.0	.84	.844	4204	26.92	7.82	.860
	Math Applic.	36	25.1	5.9	26.4	5.7	.79	.793	4118	21.30	6.46	.827
	Math Total	108	76.5	17.0	78.1	16.5	.92	.921	4001	69.88	17.33	.924
Primary 3			Grade 4.1					Form F ↓	Form F Grade 3, Spring			Form F
	Vocabulary	38	24.4	6.7	23.9	7.4	.80	.809	3931	15.48	6.28	.735
	Reading Comp.	60	39.7	12.5	38.2	13.7	.81	.818	4002	28.90	12.34	.776
	Concepts of No.	34	22.4	6.8	21.9	6.7	.86	.859	4377	19.01	6.44	.847
	Computation	42	25.9	9.3	26.3	9.2	.85	.849	4460	26.95	9.46	.857
	Math Applic.	38	24.4	8.6	24.3	8.8	.88	.881	3997	18.97	8.24	.864
	Math Total	114	72.8	22.4	72.5	22.4	.93	.930	3827	65.86	20.66	.918

*The data in columns 2-6 are from the Stanford Achievement Test Technical Data Report (Gardner et al., 1985). Information about the grades on which the data are based was provided by Psychological Corporation [in an oral communication].

**Parallel forms reliability of Rights scores for unspecified form: Correlation between Forms E and F.

***Parallel forms reliability of indicated form, adjusted for difference between Form E and Form F standard deviations (Angoff, 1953; Formula 6). This in theory is more precise than the column 6 value, although in the present instance most of the differences turn out to be negligible, falling within the rounding-error range.

APPENDIX F

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